

Digitized by the Internet Archive in 2023 with funding from University of Toronto





Government Publications TP 13198E

# TRANSPORTATION IN CANADA 1997

ANNUAL REPORT









## TRANSPORTATION IN CANADA 1997

ANNUAL REPORT





© Minister of Public Works and Government Services, Canada, 1998

Cat. No. T1-10/1997E ISBN 0-662-26773-7

Également disponible en français sous le titre «Les transports au Canada 1997»

78AD-9993

Ottawa, Canada K1A 0N5

MAY 1 8 1998

His Excellency
The Right Honourable Roméo LeBlanc, P.C., C.C., C.M.M., C.D.
Governor General of Canada
Rideau Hall
1 Sussex Drive
Ottawa, Ontario
K1A 0A1

Excellency:

I am pleased to submit to you the 1997 annual report on the state of transportation in Canada. This report responds to the requirements set out in section 52 of the *Canada Transportation Act*.

The year 1997 was a good year for transportation. It was marked by a strong economy, fueled to a large extent by the growth in international trade, an overall improvement in the financial performance of carriers, considerable improvement in safety in all modes, and the continued implementation of the reforms introduced in the transportation sector in recent years.

As world economies become more integrated and trade barriers continue to fall around the globe, much of Canada's continued competitiveness rests on the ability of its transportation sector to get its goods to market and to respond to the needs of travelers in an efficient and affordable manner, both within Canada and outside its borders.

The World Economic Forum, an organization which ranks countries in terms of their global competitiveness, has rated Canada's transportation sector as one of the best in the world.

The federal government will continue to set the framework that will allow Canada's transportation sector to compete globally and to face the challenges of the new millenium. It will also ensure that the transportation system maintains its high level of safety and that its future development is managed in a sustainable manner.

Yours sincerely.

Hon. David M. Collenette, P.C., M.P.

### **Table of Contents**

Report H	lighl	lights	i
Chapter	1.	Introduction	1
	2.	Transportation and the Economy	3
	3.	Transportation and Regional Economies	17
	4.	Government Spending on Transportation	33
	5.	Infrastructure and Associated Services	43
	6.	Safety	83
	7.	Environment	97
	8.	Air	105
	9.	Marine	127
	10.	Rail	145
	11.	Trucking	161
	12.	Bus	175
	13	Transportation Statistics	185



#### LIST OF TABLES

Table	Title	Page
2. Tran	nsportation and the Economy	
2-1	Modal Distribution of Transportation – Gross Domestic Product (GDP)	5
2-2	Gross Domestic Product and Prices	<i>6</i>
2-3	Transportation Gross Domestic Product	8
2-4	Transportation Share of Total GDP for Selected Countries	8
2-5	Transportation Employment by Mode	9
2-6	Investment in Transportation	
2-7	Total Transport Demand	10
2-8	Average Annual Spending on Transport, per household	11
2-9	Interprovincial and International Trade Flows of Total Goods	12
2-10	Interprovincial and International Trade Flows of Total Goods	
2-11	Share of Trade Flows in Total Production of Goods	
2-12	Canadian Merchandise Exports by Country	13
2-13	Canadian Merchandise Imports by Country	
2-14	Share of Canadian Merchandise Trade	14
2-15	Canadian Exports and Imports by Transport Mode	
2-16	Canada's Merchandise Exports to the US and Mexico by Major Commodity Grouping and by Mode	15
2-17 2-18	Canada's Merchandise Imports from the US and Mexico by Major Commodity Grouping and by Mode	
2-18	Canada's Trade with the US and Mexico by Province	15
3. Tran	nsportation and Regional Economies	
3-1	Structure of Regional Economies – Eastern Canada Provinces	18
3-2	Trade of Eastern Canada Provinces	
3-3	Importance of Commercial Transportation to Eastern Provinces	18
3-4	Structure of Regional Economies – Central Canada Provinces	
3-5	Trade of Central Canada Provinces	20
3-6	Importance of Commercial Transportation to Central Canada Provinces	20
3-7	Structure of Regional Economies – Western Canada Provinces and Territories	22
3-8	Trade of Western Canada Provinces and Territories	22
3-9	Importance of Commercial Transportation to Western Provinces and Territories	22
3-10	Importance of Commercial Transportation Employment to Eastern Canada Provinces	24
3-11	Importance of Commercial Transportation Employment to Central Provinces	
3-12	Importance of Commercial Transportation Employment to Western Provinces and Territories	
3-13	Importance of Total Transportation Demand to Eastern Provinces	
3-14	Importance of Total Transportation Demand to the Central Provinces	
3-15	Importance of Total Transportation Demand to Western Provinces and Territories	
3-16	Importance of Total Transportation Investment to the Eastern Provinces	
3-17	Importance of Total Transportation Investment to the Central Provinces	31
3-18	Importance of Total Transportation Investment to the Western Provinces and Territories	32
1 Cov	ernment Spending on Transportation	
4-1	Governments' Net Expenditures on Transportation	34
4-2	Governments' Revenues from Transportation – Not Credited to Transportation Budgets	34
4-3	Federal Government Gross Expenditures on Transportation	
4-4	Transport Canada's Gross Spending on Transportation	
4-5	Revenues Credited to Transport Canada's Budget	
4-6	Transport Canada – Level of Cost Recovery	
4-7	Total Direct Federal Subsidies, Grants and Contributions – by Mode	
4-8	Federal Subsidies, Grants and Contributions – Rail Transportation	
4-9	Federal Subsidies, Grants and Contributions – Highways and Bridges	
4-10	Federal Subsidies, Grants and Contributions – Trucking	38
4-11	Federal Subsidies, Grants and Contributions – Marine Transport	39
4-12	Federal Subsidies, Grants and Contributions – Air Transport	39
4-13	Federal Expenditures on Transport Facilities and Services	40
4-14	Provincial Government Expenditures on Transportation	41
4-15	Local Government Expenditures on Transportation	42

Table	Title	Page
5. Infra	structure and Associated Services	46
5-1	Canada's Air Navigation System Workload Statistics	
5-2	Passenger Traffic at Canadian Airports	
5-3	Cargo Traffic at Canadian Airports	
5-4	Total Revenues and Expenses of Canada's Airport Authorities Total Tonnage Handled in Canada's Port System	
5-5	Containers Handled at Canadian Ports	
5-6	Canada's Container Traffic Trans-shipped Through the US Port System	
5-7	US Container Traffic Trans-shipped Through Canada's Port System	
5-8 5-9	Financial Profile, Ports Canada Ports	
5-10	Revenues, Expenses and Incomes of the Ports Canada System	56
5-10	Financial Profile of Canada's Harbour Commissions	57
5-12	Financial Profile of Ports Remaining Under Transport Canada Control	57
5-13	St. Lawrence Seaway Cargo Movements	58
5-14	St. Lawrence Seaway Financial Performance	59
5-15	St. Lawrence Seaway Authority Reserve Fund	59
5-16	Pilotage Assignments	
5-17	Pilotage Authorities – Revenues and Expenditures	
5-18	Canadian Coast Guard Fleet and Facilities	
5-19	Revenues and Budgeted Expenditures of the Canadian Coast Guard	
5-20	Canada's Railway Infrastructure	
5-21	Major Shortline Corporations Operating in Canada	
5-22	CN and CP Rationalization by Province	65
5-23	CN and CP Three-Year Rationalization Plans by Province	66
5-24	Canada's Road System by Province or Territory	68
5-25	Upgrading Costs for the National Highway System	71
5-26	National Highway System Spending Estimates	72
5-27	Daily Traffic Levels on the National Highway System	73
5-28	Annual Car and Truck Traffic for Major Border Crossings	74
6. Safet	v	
6-1	Transportation Occurrences – 1997 vs. Five-Year Average	84
6-2	Occurrences in Aviation Transportation	
6-3	Accident and Fatality Rates in Canada and the US for Level I And II Air Carriers	85
6-4	Accident and Fatality rate in Canada and the US for Level III and IV Air Carriers	85
6-5	Occurrences in Marine Transportation	86
6-6	Occurrences in Rail Transportation	86
6-7	Total Road Collisions and Casualties	88
6-8	Road Fatalities by Categories of Road Users	88
6-9	Annual Number of Accidents, Fatalities and Injuries	90
6-10	Estimated Average Cost of Fatalities, Injuries and Property Damage Resulting from Road Vehicle Accidents	90
7. Envir	ronment	
7-1	Canadian Motor Vehicle Fuel Efficiency	100
7-2	Air Emissions from Transportation Sources	102
7-3	Trends in the Atmospheric Concentration of Indicated Pollutants	103
	The second of th	104
8. Air		
8-1	Carriers Designated by the Minister of Transport in 1997	107
8-2	All Craft of Selected Canadian Carriers in Passenger Services	100
8-3	Licence Authornes Held in 1997	100
8-4	Domestic Passenger Traffic - Top 20 City-Pairs - Scheduled vs. Charter Services	110
8-5	Domestic Sector Englaned and Deplaned Passengers	110
8-6	New All Scivices in Transporder Markers	110
8-7	Transported Fassenger Traine for Scheduled, Regional and Charter Operations	110
8-8	international Lassenger Harric	
8-9	Transcende Americas of Canada S Maior Air Carriers	4 4 4
8-10	attropation of Calladial All Callers III Transporder Courier Operations	
8-11	Tarac of Canadian International Trade S Air Share	
8-12	Talue of Canadian Exports by Alf — Wall Desinations	
8-13	Value of Canadian Imports by Air – Main Countries of Origin	116

Table	Title	Page
8. Air	(continued)	
8-14	Aircraft Movements at Towered Airports	117
8-15	Summary of Personnel Licences as of January 1998	117
8-16	Price and Output Changes in the Airline Industry	119
8-17	Cost Structure and Efficiency Indicators in the Airline Industry	121
9. Mai	rine	
9-1	Shipping Conferences Serving Canada in 1997	134
9-2	Canada's Marine Traffic Flows, by Sector	135
9-3	Marine Domestic Flows, by Canadian Region	
9-4	Canada's International Trade - Marine Transportation	
9-5	Canada's Marine Traffic to the US	
9-6	Canada's Marine Traffic from the US	
9-7	Canada's Marine Traffic to Overseas	
9-8	Canada's Marine Traffic from Overseas	139
9-9	Cruise Ship Traffic at Major Canadian Ports	139
9-10	Conference/Non-conference Shares of Canadian Liner Trade	140
9-11	Liner Traffic by Region	140
9-12	Price and Output Changes in Marine Transport	141
9-13	Productivity and Unit Cost Changes In Marine Transport	143
9-14	Financial Highlights of the Marine Industry	143
10. Ra	ail and the state of the state	
10-1	Destination of Imports From the US by Rail	146
10-2	Origin of Exports to the US by Rail	146
10-3	Rail Exports to the US by Commodity	147
10-4	Rail Imports from the US by Commodity	148
10-5	Canada/US Railroad Price Comparison	152
10-6	Output and Price Changes in Rail Freight	152
107	Cost Structure and Efficiency Indicators – CN and CP	
10-8	Financial Performance Highlights of Canada's Rail Transport Industry	
10-9	Railway Net Fixed Assets as of December 31, 1996	
10-10	Financial Performance Highlights of VIA Rail Passenger Industry	
10-11	Cost Structure and Efficiency Indicators of VIA rail	
10-12	Output and Price Changes in VIA Rail	160
11. Tr	ucking	
11-1	Distribution of Truck Traffic by Sector	
11-2	For-hire Trucking Activity Revenues by Commodity Group	
11-3	For-hire Trucking Traffic by Commodity Group	
11-4	Distribution of Trucking Activity by Travel Sector	
11-5	Distribution of Truck Traffic by Type of Carriage	
11-6	Driver Distribution of Truck Traffic	
11-7	Truck Types on Canada's Roads	
11-8	Canada's Exports by Truck	108
11-9	Canada's Imports by Truck	108
11-10	Trucking Bankruptcies Across Canada	170
11-11	Distribution of Total For-Hire Trucking Revenues by Size of Carrier	170
11-12	Average Annual Revenues by Size of Carrier	171
11-13	Output and Price Changes in Trucking	172
11-14 11-15	Financial Results of For-Hire Trucking Firms	173
12. Bu	Summary of Revenues by Sources of Revenue	176
12-1	Price and Output Changes in the Bus Industry	182
12-2	Financial Highlights of the Canadian Bus Industry – Inter-City Scheduled and Charter Services	183
12-3	Cost Structure and Efficiency Indicators of the Bus Industry	184

#### LIST OF FIGURES

Figure	Title	Page
2. Tran	sportation and the Economy	
2-1	Domestic Passenger Travel, Per Capita – By Mode	. 4
2-2	Domestic Freight Transportation, Per Capita – By Mode	. 4
2-3	Relative Importance of Goods and Services Production	. 3
2-4	Relative Importance of Goods Producing Industries	
2-5	Gross Domestic Product Trends, Goods Production vs. Freight Transportation	. 6
2-6	Transportation Share of Total GDP	. 8
	astructure and Associated Services	45
5-1	Canada's Air Navigation System	
5-2	Canada's National Airports System	
5-3	Financial Results of Airport Authorities	
5-4	Financial Ratios of Airport Authorities	
5-5	Canada's Major Ports	
5-6	Operating Ratios and Returns on Assets for Canada's Major Ports	
5-7	Operating Ratios and Returns on Assets for Canada's Divisional Ports	63
5-8	Canada's Rail Network	
5-9	CN and CP Discontinuances and Transfers of Lines	
5-10	Canada's National Highway System	
5-11	Traffic on the National Highway System	
5-12	Daily Traffic Levels Between Canada and the US	
5-13	Annual Car and Truck Traffic by Largest Border Crossing	13
6. Safet	ty	
6-1	Comparison of Rail Safety – Canada vs. US	. 87
6-2	Number of Trespasser Fatalities at Railway Crossings – Canada vs. US	. 87
6-3	Road Fatality Rate by Province	. 88
6-4	Percentage of Road Collisions and Fatalities Involving Commercial Vehicles	89
6-5	Fatality Rates Among OECD Countries	. 89
7 E		
	ronment	0.0
7-1	Canada's Actual and Projected Annual Emissions of Global Warming Gases by Sector	
7-2	Energy Use by the Transportation Sector	
7-3	Per Capita Sales of Petroleum Products for Transport Purposes	
7-4	Sales of Petroleum Products for Transport Purposes	
7-5	Litres of Fuel per 100 Vehicle-kilometres (Cars, Including SUVs, etc.) or Per 100 Tonne-kilometres	101
8. Air		
8-1	Proportion of Personnel Licences and Permits by Province	109
8-2	Regional Breakdown of Domestic Passengers (Enplaned and Deplaned)	111
8-3	Transborder Passenger Traffic	111
8-4	Number of Seats Offered in the Transborder Market	113
8-5	Value of Canadian Imports and Exports with the US by Air and by Province of Clearance	115
8-6	Profile of the Recreational Aviation Fleet	118
8-7	Canadian Air Transport Industry – Operating Revenues	119
8-8	Operating Revenues of Large Carriers by Market Segment	120
8-9	Significant Growth in International Passenger Revenues – Air Canada and Canadian Airlines Including Affiliates	120
8-10	Air Transport Industry – Operating Margin	121
8-11	Capital Expenditures - Air Canada and Canadian Airlines	122
9. Mari	ina	
9-1		100
9-2	Canadian Registered Fleet Canadian Registered Fleet By Type	129
9-3	Canada's Maritime Trade with the US	130
9-3	Canada's Maritime Overseas Trade	136
9-5	Marine Freight Rate Indices	138
9-6	Canadian-domiciled For-hire Water Carriers – Sources of Operating Revenues	142
- 0	Canadam Controlled 1 of into water Carners – Sources of Operating Revenues	142

Figure	Title	Page
10. Rail		
10-1	Rail Revenue Tonne-Kilometres	146
10-2	Canada/US Rail Exports and Imports	147
10-3	Value of Principal Commodities Exported by Rail to US and Mexico	148
10-4	Total Monthly Rail Traffic	149
10-5	Year Over Year Change in Traffic Volume	149
10-6	Monthly Grain Traffic Loadings	150
10-7	Rail Intermodal Traffic	151
10-8	Traffic Volume and Market Share	153
10-9	Rail Passenger Traffic Volumes	153
10-10	Canadian Rail Transportation Industry – Operating Revenues	154
10-11	Railway Employment Trends	154
10-12	Canadian National Railway - Operating and Net Income	157
10-13	Canadian Pacific Railway - Operating and Net Income	157
10-14	Rail Freight Transportation in Canada – Operating Margins	
10-15	Railway Capital Expenditures in Canada by CN and CP	158
11. True		
11-1	Trucking Industry Structure and Revenues	
11-2	Number of For-hire Carriers	
11-3	Operating Margins of the For-hire Trucking Industry	173
12. Bus		
12-1	Bus Industry Structure and Revenues	
12-2	Fleet Size of Scheduled Intercity Bus Activity	
12-3	Fleet Utilization of Scheduled Intercity Bus Activity	
12-4	Annual Scheduled Intercity Bus Activity – Passengers and Bus-kilometres	
12-5	Scheduled Intercity Bus Activity – Passengers per 100 Vehicle-kilometres	178
12-6	Fleet Size of Charter Bus Activity	
12-7	Fleet Utilization of Charter Bus Activity	
12-8	Charter Carriers' Bus-kilometres	
12-9	Urban Transit Fleet Size	
12-10	Urban Transit Fleet Utilization	
12-11	Long-term Trends in Urban Transit	
12-12	Urban Transit Passengers per 100 Bus-kilometres	
12-13	Cost Components of the Intercity Bus Industry	
12-14	Operating Margins of Intercity Scheduled and Charter Bus Industries	184
LIST	OF ANNEXES	
Annex	Title	Page
	structure and Associated Services  Total Aircraft Movements	. 77
5-1	Enplaned and Deplaned Passengers	78
5-2	Enplaned and Deplaned Passengers  Enplaned and Deplaned Cargo	
5-3	Airports Capital Assistance Program Projects Approved in 1997	
5-4	Percentage Change in Total Tonnage Handled by Ports Canada	81
5-5a	Percentage Change in Total Tonnage Handled by Harbour Commissions  Percentage Change in Total Tonnage Handled by Harbour Commissions	81
5-5b	Percentage Change in Total Tonnage Handled by Tracourt Commissions	82
5-5c	Percentage Change in Total Tonnage Handled by Transport Canada and Other Ports	02
8. Air		122
8-1	Status of Transborder Services by Carrier Nationality	123
8-2	Status of Transborder Air Services as of February 24, 1998	124
8-3	Status of International Air Services as of February 24, 1998	120



## REPORT HIGHLIGHTS

The transportation sector was marked in 1997 by a strong economic performance, new legislative initiatives, overall improved financial performance of transportation carriers, and additions to enhance Canada's transportation system.

## TRANSPORTATION AND THE ECONOMY

- The transportation sector benefited again in 1997 from a robust economy, a performance fueled to a large extent by a strong external trade. Activity in transportation increased by 5.4 per cent in 1997.
- Total annual spending on transportation in Canada is around \$125 billion, including \$83 billion on private auto sales, maintenance and fuel, and \$35 billion on commercial freight and passenger transportation.
- Annual investment in transportation averages over \$17 billion, accounting for about 19 per cent

- of total investment in the economy. Some 87 per cent of that amount is in road transportation equipment (including automobiles) and road infrastructure.
- Forty per cent of Canada's domestic production is exported, linking our growth to our success in the global economy.
- With the US as our major trading partner, almost two-thirds of our exports move by road as opposed to 26 per cent by rail. There is even more dependence on roads for our imports.
- Transportation is also important for domestic trade, particularly for provinces such as Prince Edward Island, New Brunswick, Nova Scotia and Manitoba that import

- more than 30 per cent of their gross domestic product (GDP) from other provinces. All provinces, with the exception of British Columbia and Newfoundland, export more than 20 per cent of their GDP to other provinces.
- In 1997, some 470,000 persons were directly employed in the transportation sector in Canada. Since 1992, transportation employment has increased by almost three per cent a year.
- The average annual salary in transportation in 1997 reached \$37,239, about 17 per cent higher than the average in the economy as a whole.

 In 1997, the average Canadian household spent \$6,655 on transportation, roughly 14 per cent of its budget and more than it spent on food.

#### Transportation and Regional Economies

- Both Eastern and Western
  Canada make greater use of
  for-hire carrier transportation
  compared to Central Canada.
  This is primarily due to the
  greater distance to and from
  markets, lower population
  density, higher dependence on
  interprovincial trade, and higher
  shares of primary commodity
  production in Eastern and
  Western Canada.
- British Columbia, being a transport hub for trade with the Pacific rim countries, exhibits a higher proportion of for-hire carrier transport than other provincial economies.
- The province with the highest level of total transport spending as a proportion of total provincial spending is British Columbia (20.1 per cent), but the Territories, with 21.4 per cent, are the jurisdiction with the highest level.

#### GOVERNMENT SPENDING ON TRANSPORTATION

• In 1996/97, total government spending, net of revenues earmarked to transportation, amounted to \$16 billion broken down as follows: \$2.7 billion by the federal government, \$7.1 billion by provincial/territorial governments and \$6.1 billion by municipal governments. The \$16 billion total was down from the 1995/96

- total of \$17.2 billion. As a result of an overall reduction in subsidies, the federal portion dropped to \$2.7 billion, from \$3.3 billion in 1995/96.
- Transport Canada's costrecovery initiatives amounted to \$587 million in 1996/97 after peaking at almost \$1.2 billion in 1995/96 when the Air Transportation Tax (ATT) was still credited to the departmental budget. In 1997/98, Transport Canada revenues are expected to drop to \$224 million.
- Additional unassigned government revenues from transportation in 1996/97 amounted to \$12.4 billion, including \$4.0 billion in federal fuel taxes and \$5.6 billion in provincial/territorial fuel taxes. Provincial/territorial licence fees amounted to \$2.7 billion.

#### Infrastructure and Associated Services

#### AIR NAVIGATION SYSTEM

• In its first year of operation in 1997, Nav Canada received approval for its proposed fee structure, which is being implemented in two stages: the first on March 1, 1998, and the second on November 1, 1998. The ATT is being eliminated to make way for these direct charges to users.

#### **AIRPORTS**

 Local airport authorities took over operations of local airports in Victoria, Winnipeg, Thunder Bay, Ottawa and Moncton in 1997. Currently more than 90 per cent of all passenger traffic in Canada passes through airports operated by local airport authorities.

- The Greater Toronto Airports Authority purchased Terminal 3 and selected a design consortium for the redevelopment of the other two terminals at Pearson airport. A new parallel north—south runway began operations in November.
- Vancouver International Airport Authority announced plans for a \$114-million expansion.
- Ottawa's Macdonald-Cartier International Airport became the seventh Canadian airport with facilities for US customs and immigration pre-clearance for passengers on US-bound flights.
- The Calgary Airport Authority began a \$28 million capital program, including improvements to vehicle parking, Canada customs space and aircraft parking.
- The Edmonton Regional Airport Authority began work on a terminal redevelopment program at the international airport.

#### **PORTS**

- The Port of Vancouver officially opened its Deltaport Container Terminal in 1997, doubling the port's container handling capacity to 1.2 million Twenty-Foot Equivalent Units. The new facility can handle the largest container vessels currently in service and transfer containers to double-stack rail cars for immediate dispatch to Central Canada and the US Midwest.
- The federal government transferred the Port of Churchill to the Hudson Bay Port Company, an affiliate of OmniTRAX Inc., in September 1997. OmniTRAX also owns the Hudson Bay Railway, which acquired 1,300 kilometres of rail line between The Pas and Churchill previously owned by Canadian National.

#### CANADIAN COAST GUARD

 The Canadian Coast Guard (CCG) continued its efforts to reduce its expenditures and improve efficiency; it introduced in 1997 the Maintenance Dredging Services Tonnage Fee for the St. Lawrence Ship Canal.

#### RAIL

 In 1997, five shortline corporations which dominate Canada's shortline rail industry

 Railtex, Iron Road, OmniTRAX,
 Railtink, Genessee Rail-One –
 added over 3,000 kilometres of track to their networks,
 primarily as a result of transfers or leasing agreements with CN

 and CP Rail.

#### ROADS

- The Confederation Bridge between Prince Edward Island and New Brunswick was officially opened in June 1997. Also notable was the transfer of some segments of provincial roads to municipal responsibility in Alberta and Ontario.
- The first completely electronic toll highway – Highway 407 – opened for traffic in Ontario.

#### SAFETY

- The general level of safety in all modes improved considerably in 1997. The number of accidents, accident rates and the number of fatalities were generally lower than the previous year and/or the average of the previous five years.
- There were 352 aviation accidents in 1997, up slightly (three per cent) from 1996 but 11 per cent below the 1992–96 average. The rate of nine accidents per 100,000 hours

- flown represents a two per cent increase over 1996, but a decrease of 17 per cent from the 1992–96 average. The 76 fatalities indicated an eight per cent increase from 1996, but a 14 per cent reduction over the 1992–96 average.
- There were 528 shipping accidents in 1997, a 19-year low, down 12.5 per cent from 1996 and 27 per cent from the 1992–96 average; the number of fatalities was also 27 per cent lower than the 1992–96 average; and the accident rate at 3.9 per 1,000 vessel movements has remained relatively stable since 1994.
- There were 1,125 railway accidents in 1997, down 14 per cent from 1996 and three per cent below the 1992–96 average; nine accidents per million train-kilometres, down 17 per cent from 1996 and three per cent from the 1992–96 average; and 107 fatalities, the lowest since 1990, and 11 per cent below 1996 and the 1992–96 average.
- There were 661,000 road accidents in 1995, seven per cent below the 1990–94 average; 159,000 motor vehicle casualty collisions in 1996, five per cent below 1995 and seven per cent below the 1991–95 average; 3,082 persons were killed in road accidents in 1996, eight per cent below 1995 and 11 per cent below that of 1991–95 average; and the fatality rate in 1995 was 1.96 per 10,000 registered motor vehicles, compared to 2.17 in the United States.
- The annual cost of transportation fatalities, injuries and property damages (to road motor vehicles only) was estimated to be in the order of \$15 billion, a figure that does

- not reflect damages to property from transportation accidents.
- · The federal government expenditures were in the order of \$315 million for implementation of various safety measures. The provincial government safety-related expenditures in 1997 were also in excess of \$300 million. Expenditures by municipal governments toward railway/highway grade crossing improvements were \$20 million annually. Their contributions for road safety improvements, while significant, are not captured in this report.

#### Environment

- The sustainability of the transportation sector received greater focus in 1997 with the consultative process of developing, and ultimately tabling in Parliament, Transport Canada's Sustainable Development Strategy.
- Another significant event was the Kyoto Protocol to the Framework Convention on Climate Change. Meeting Canada's target to reduce greenhouse gas emissions will require a broad-based response by all stakeholders in Canada's transportation system by governments, by the private sector and by individuals if sustainable reductions in transport emissions are to be achieved.
- In 1990, the transportation sector contributed about 26.5 per cent of total greenhouse gas emissions in Canada as measured in megatonnes of carbon dioxide equivalents. In 1995, transportation's portion was 26.4 per cent.

• Precursors to low level ozone (smog) such as nitrogen oxides and volatile organic compounds have declined substantially per vehicle-kilometre since the introduction of emission standards in the 1970s. Stricter vehicle emission standards will apply to 1998 model year vehicles. However, traffic growth since 1991 has caused total emissions to increase slightly. Transportation is responsible for between 40 and 50 per cent of smog.

#### AIR

- The financial health of the domestic air services market continued to improve in 1997, although marked by the cessation of jet aircraft operations by Kelowna Flightcraft on behalf of Greyhound Transportation Canada Ltd., and by Vistajet.
- 1997 marked the end of the two-year transition period for new US services to Vancouver and Montreal under the 1995 Canada-US Air Agreement, and the number of new services initiated since its signing has now reached 107.
- International services continued to expand and were marked by a more frequent use of codesharing with foreign alliance partners, which allows Canadian carriers to have a presence in a vastly increased number of markets without having to provide their own aircraft.
- Pilot projects under way at Vancouver with "intransit preclearance" and "transit without visa" are designed to test procedures which will allow foreign passengers flying via Canada to the United States to bypass Canadian Customs and

- proceed directly to US inspection authorities, frequently with no need for a Canadian visa.
- International scheduled services to and from Montreal were for the most part relocated to Dorval, with charter and all-cargo services being assigned to Mirabel as a result of a decision by Les Aéroports de Montréal, which took effect in the fall of 1997.

#### MARINE

- The Canada Marine Act was re-introduced in Parliament during the fall session. The Bill will make it easier for major ports to operate in a commercial manner, allow the Minister to transfer the day-to-day management of Seaway operations to a users group, and provide for a review of pilotage.
- Amendments to the Canada Shipping Act (Bill S-4) will increase the amount of compensation available to claimants for maritime claims, including oil pollution damage.
- Marine Atlantic has seen a
   drastic reduction in the ferry
   services under its sphere of
   responsibility. The
   Confederation Bridge replaced
   the Borden, PEI Cape
   Tormentine, N.B. ferry service;
   the Bay of Fundy and Yarmouth
   – Bar Harbour services were
   transferred to a private operator,
   Bay Ferries Ltd.; and control
   over Labrador's coastal marine
   service passed to the
   Government of Newfoundland.
- Canadian Pacific Ltd. moved into the ranks of the major international liner operators through the acquisition of USbased Lykes Bros. Steamship Co.

- and UK-headquartered Contship Containerlines Ltd.
- · Despite a significant decline in both vessel numbers and capacity over the past decade, the Canadian registered merchant fleet continued to dominate Canada's domestic trade, carrying 98 per cent of the traffic. The Canadian fleet was also active in the transborder trades between Canada and the US, carrying 55 per cent of this traffic. However, on the deep-sea trade, the Canadian flag fleet carried less than one per cent of the traffic, with Canadian shippers relying on foreignbased carriers for most deep-sea movements.

#### RAIL

- In aggregate, rail freight traffic levels increased by about seven per cent during 1997, making the past year the strongest in railway history.
- 1997 saw a record number of lines transferred and new railways created.
- Severe weather conditions led to disruptions in rail transportation services to the West Coast in the early part of the year.
- These disruptions resulted in reduced volumes of grain and coal in particular during the first quarter as compared with previous years; however, volumes of these, and other commodities, rebounded quickly, exceeding previous years' levels – in some cases significantly – by the year-end.
- The disruptions to the grain handling system are currently under investigation by the Canadian Transportation Agency.

#### TRUCKING

- A review of the Motor Vehicle Transport Act, 1987 (MVTA), is under way in conjunction with the provinces and stakeholders.
- Customs rules governing equipment usage were liberalized in both Canada and the US, improving the efficiency of carrier operations in both countries.
- Truck traffic and revenues continued to increase, particularly in transborder operations.
- 1997 was another year of structural changes for the trucking industries. Alliances between carriers, mergers and acquisitions of carriers were observed, all with the objective to expand or rationalize services. Partnerships between firms on each side of the Canadian border were again reported.
- The financial performance of the trucking industry in 1997 was positive, showing strong growth in revenues coupled with improved operating margins.

#### Bus

- The regulatory regime governing extra-provincial bus services is being examined as part of an overall legislative review of the MVTA.
- Structural changes in the industry included acquisition of Canada's largest bus company
   Greyhound – by Laidlaw Inc.
- Scheduled intercity bus ridership continued to decline, while charter saw increased passenger traffic over the past year.



## INTRODUCTION

The mandate of this second report was once again interpreted broadly. The focus has been placed, as much as possible, on 1997 information.

This is the second annual report submitted by the Minister of Transport to Parliament on the state of transportation in Canada. The report covers the year 1997, within the limits of data availability. It responds to the requirements set out in section 52 of the *Canada Transportation Act*, which states that:

"Each year the Minister shall, before the end of May, lay before Parliament a report briefly reviewing the state of transportation in Canada in respect of the preceding year, including:

- (a) the financial viability of each mode of transportation and its contribution to the Canadian economy and the development of the regions;
- (b) the extent to which carriers and modes of transportation were provided resources, facilities and services at public expense;
- (c) the extent to which carriers and modes of transportation received compensation, indirectly or directly, for the resources, facilities and services that were required to be provided as an imposed public duty; and

(d) any other transportation matters the Minister considers appropriate."

This mandate is interpreted in the broadest possible way, taking into account all significant aspects of the Canadian transportation system, pipelines being the only transportation activity not covered.

#### STRUCTURE OF REPORT

The next two chapters of the report provide an overview of the importance of the transportation industry to the economy, both at the national and regional levels. This is followed by four chapters, which take a horizontal look at all modes, and deal respectively with government spending, infrastructure, safety and the environment. Five modal chapters - air, marine, rail, trucking and bus - complete the review of the state of transportation. In addition to pointing out the important legislative and regulatory changes introduced in 1997, these chapters present detailed information on the operations and finances of each mode.

#### CHANGES FROM 1996 REPORT

While the report follows a similar layout to that of its predecessor, there are some differences. Two important differences are the absence of separate chapters on private passenger vehicles and intermodal transport. In this report, the subject of private passenger vehicles is dealt with in the context of road transportation. Intermodal transport is more specifically addressed in three chapters of the report - Infrastructure, Marine and Rail. The chapters on safety and the environment have been moved closer to the front of the report. given their importance as broad policy objectives.

The first report on transportation in Canada discussed in detail the legislative and regulatory framework for each mode at the federal, provincial and municipal levels. Only the changes in legislation that occurred in the past year are reflected in this year's report. Also, the first edition highlighted many of the trends that have emerged in recent years throughout the modes. This served to set the stage for the examination of the state of transportation in the ensuing years.

Finally, every effort was made to focus on data from the preceding year in the coverage reported, data availability being the deciding factor in the end. When 1997 information was not available, the most recent information accessible was reported.

# TRANSPORTATION AND THE ECONOMY

A solid performance of the Canadian economy, and a dynamic trade sector, increased both the level of activity and the relative importance of transportation.

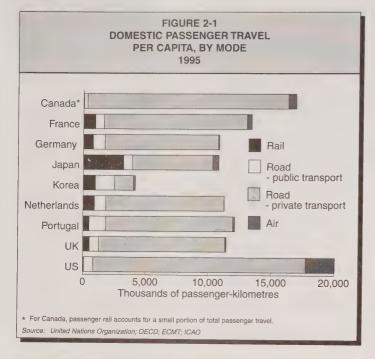
This chapter begins with a comparison of the importance of the transportation sector in Canada with the sector's importance in other countries. Then it moves to major influences of recent years on transportation demand, examines general economic conditions in 1997, and assesses transportation's contribution to the economy in terms of the sector's gross domestic product, employment and spending. Finally, the chapter looks at linkages between transportation and trade.

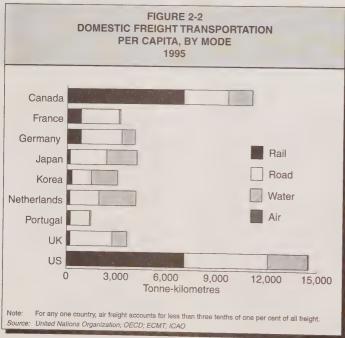
Canadians are very dependent on transportation. For most, transportation is key to doing business and for moving from place to place. For many others, transportation is employment.

Canada's size dictates that people and goods generally travel considerable distances to reach their destination. Per capita, Canada ranks second in passenger travel among major industrialized countries, far behind the US. Canada is significantly higher, (20 per cent), than Western Europe.

Over 90 per cent of all passenger travel is done by automobile in Canada, compared with 84 per cent for the US and just over 80 per cent for the other countries. Figure 2-1 illustrates domestic passenger travel in Canada.

In terms of freight transportation, the divergence is even greater. As shown in Figure 2-2, Canada's per capita tonne-kilometres is more than twice as high as in Western Europe, but almost 25 per cent lower than in the US.





#### STRUCTURAL CHANGES AND TRANSPORTATION

Since the early 1960s, Canada's economy has experienced ongoing structural changes. These changes are evident at the aggregate and industrial levels, and include changes in transportation services. Figure 2-3 shows the relative importance of services and goods production over the last 16 years. Some traditional sectors – primary resources, manufacturing and construction - are losing ground to the service sector. The production of goods, which accounted for 35 per cent of total production in 1981, accounts for only 33 per cent now.

Whether they rank low or high on the scale of structural change, some industries within these aggregates are experiencing more structural changes than others. In the transportation sector, this trend can be witnessed in freight transportation services. While total freight transportation went up by 66 per cent since 1981, trucking increased by 109 per cent, marine transportation by only 13 per cent, and rail by 42 per cent. These changes indicate a shift away from rail and marine toward trucking.

Table 2-1 gives a brief overview of how the relative share of each transportation mode has changed over the last 16 years.

During this period, freight transportation has shifted significantly, with trucking making the most dramatic gains. There are two main reasons for this. First, the structural changes to the overall economy have resulted in a shift in goods production, which in turn means changing freight transportation needs. For example, the current trend is to keep inventories low,

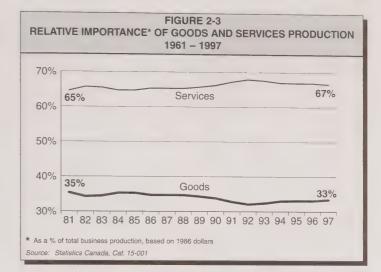
and the "just-in-time" delivery system now in fashion is best suited to trucking. Second, transportation prices have had low increases, prompting shippers to use better quality services, such as door-to-door delivery, for which the truck mode is well equipped.

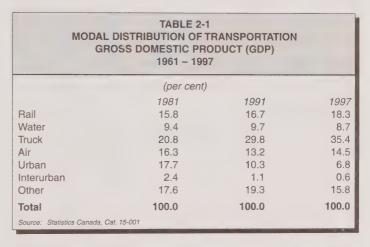
Figure 2-4 shows how, over the last 16 years, the three traditional goods-producing sectors of the economy – manufacturing, primary resources, and construction and utilities – have seen their relative importance fluctuate.

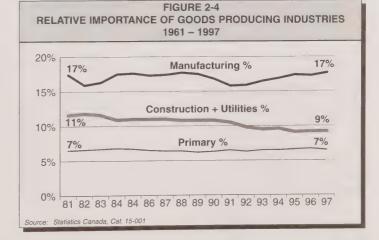
In 1997, goods production increased by 4.8 per cent, compared with 3.9 per cent for the economy. The sector regained the ground lost during the 1990 – 1991 recession, reaching about 33 per cent of total production in 1997. The service sector, lost slightly from the traditional sectors.

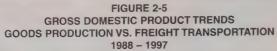
Equally relevant, the type of goods produced is shifting away from raw materials to finished or semi-finished products. The most significant gain observed in 1997 was in manufacturing, which rose by over six per cent, compared with the primary resources sector, which increased by less than three per cent.

Many industries make products for export, which means business for the transportation sector. For example, almost 76 per cent of non-electrical machinery, 89 per cent of electrical equipment and 84 per cent of transportation equipment are exported. Imports of commodities are also important in terms of domestic demand for transportation.









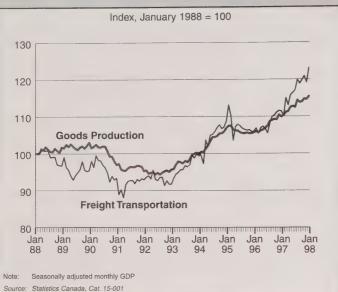


TABLE	2-2		
GROSS DOMESTIC PRO	DUCT	AND	PRICES

	1997 (Level)	1996 – 1997 (Real % change)	1991 – 1997 (AAPC) <sup>1</sup>
GDP (billions of dollars)	(Level)	(near % criariye)	(AAFC)
,	CO4	0.0	0.4
Total	691	3.9	2.4
Goods Industries	231	4.8	2.7
Services Industries	460	3.4	2.2
Transport	25.4	5.4	2.5
Freight	15.8	8.3	4.2
Air	3.7	5.9	4.0
Urban	1.7	-0.7	-4.4
Other <sup>2</sup>	4.2	-2.4	-1.1
Population (millions)	30.3	1.1	1.2
Prices - Total economy 3	106.6	0.6	1.4
Transport 4	97.7	1.4	-0.3

GDP is at factor cost and in billions of 1992 dollars. Freight includes rail, truck and water transport.

All per cent changes are in real terms.

AAPC = Average annual per cent change
 Includes taxis, interurban and other transportation

3 GDP prices, 1992=100.0

4 Transport Canada estimates

Source: Transport Canada; Statistics Canada, Cat. 13-001; 13-531; 15-001; 62-001 and 91-002

Because it touches almost every economic transaction, transportation is vulnerable to variations in the business cycle, as well as to long-term structural changes. The transportation sector's performance and prospects are related to those of the economy.

With its derived demand, transportation grows when the economy grows, and likewise slows down with the economy during downturns.

Since the 1970s, however, growth in the economy has differed from that in the transportation sector for two reasons: the increased relative importance of services; and greater productivity in the transportation sector.

Figure 2-5 plots the growth cycles of goods production and freight transportation, revealing the periods when they are synchronized and when they are not.

The transportation sector is tied more closely to the production of goods than to total economic activity, with the movement of goods accounting for about two thirds of all transportation activity. For its part, goods production is more affected by business cycles than is the service sector. It follows, therefore, that freight transportation changes are more closely related to changes in goods production than to total economic activity.

#### 1997 – A GOOD YEAR FOR TRANSPORTATION

## GROSS DOMESTIC PRODUCT

Gross Domestic Product (GDP), the total value of the goods produced and the services provided in a country in one year, is a key element in understanding the impact of any one factor on the economy. By comparing the overall economy's GDP to the transportation sector's GDP, it becomes easier to understand transportation's role in and contribution to Canada's economy.

Canada's GDP increased by 3.9 per cent in 1997, up dramatically from 1.6 per cent in 1996. The total GDP increase resulted from a 4.4 per cent rise in domestic demand and a 8.6 per cent increase in exports. This surge in domestic demand is the strongest since 1988.

Just as Canada's GDP rose in 1997, so did transportation's GDP – by a significantly higher figure of 5.4 per cent. In fact, during the recovery and expansion period of 1993 to 1997, transportation services regularly grew faster than total economic activity, due largely to the strong impetus of trade in Canada's growth.

Freight modes increased by 8.3 per cent, spread across rail and truck modes. Passenger transportation increased only in the air sector, by 5.9 per cent. Urban transportation, however, continued to post negative growth rates, maintaining a downward trend that began in the early 1980s.

Table 2-2 shows Canada's GDP and the transportation sector's GDP in 1997, as well as giving the

change between 1996 and 1997 and the average annual per cent change over the previous six years, 1991 to 1997.

#### TRADE ACTIVITY

Merchandise exports were up by 9.1 per cent in 1997, with strong showings in manufactured goods, crude oil and natural gas. Among the manufactured goods, the most notable increases were in paper and allied products; chemicals; and machinery and equipment, including office equipment.

Fueled by a strong domestic demand, merchandise imports soared by almost 15.9 per cent. Imports of machinery and equipment, primary metals, and petroleum and coal products increased significantly, followed by automobiles and automobile parts. Agricultural product import increases were below average.

#### EXPENDITURES

There were a number of notable showings on the expenditure front. Consumer spending was up by 3.9 per cent. Likewise, spending on commercial transportation services by consumers totaled two per cent more. Total transportation spending (including auto purchases and related expenditures) was up three per cent. Private fixed investment rose by 14.5 per cent, with its largest component, machinery and equipment, soaring by close to 20 per cent.

Non-residential construction, which influences freight transportation activity, posted a hefty 9.1 per cent increase in 1997, the highest in almost a decade. Residential construction, also an influencing factor, enjoyed a strong growth rate for the second consecutive year.

In the overall economy, lower interest rates meant lower interest payments on corporate debt, which saw profits rise by 17 per cent in 1997. Transportation benefited in particular, being a sector where capital/output ratio is high and debt servicing is important.

With inflation at 1.6 per cent, transportation prices dropped by 0.5 per cent. In general, transportation prices have shown almost no increase since 1991.

The lower Canadian dollar helped exports growth, also good news for the transportation sector. The increase in employment and lower interest rates helped consumers finance increased spending, including transportation spending.

#### TRANSPORTATION'S CONTRIBUTION TO THE ECONOMY

By moving people and goods, and by generating profits and paying salaries, transportation contributes to the economic wellbeing of Canadians. Apart from its strategic role, the size of the transportation service industry in terms of GDP is significant. This sector is larger than the agriculture, fishing and trapping, logging and forestry industries combined.

Transportation accounted for 3.7 per cent of total GDP in 1997. Figure 2-6 charts how transportation's GDP has declined almost continuously over the last 13 years.

However, strong economic growth in 1997 pulled transportation activity to a higher level. Compared to 1996, transportation GDP in 1997 increased by 5.4 per cent in real

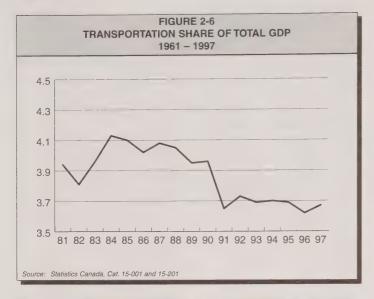


TABLE 2-3 TRANSPORTATION GROSS DOMESTIC PRODUCT								
	Truck	Rail	Air	Marine	Other*	Total		
Transport GDP (Billions 92 \$)	9.0	4.6	3.7	2.2	5.9	25.4		
Per cent change - 97/96	9.3	9.0	5.9	3.2	-1.7	5.4		
* Includes urban transit, taxis, inter-urban and other modes.  Source: Statistics Canada, Cat. 13-001.								

	TABLE 2-4 TRANSPORTATION' SHARE OF TOTAL GDP FOR SELECTED COUNTRIES (Based on current values of national currency)								
	New Zealand	Australia	Italy	France	US	Germany	Canada		
1981	5.2	5.1	4.1			,			
1901	5.2	5.1	4.1	4.0	3.7	3.6	4.3		
1987	5.1	5.0	4.1	3.8	3.4	3.3	4.1		
1991	4.9	4.9	4.3	3.7	3.2	3.3	3.8		
1996	4.8	4.7	4.3	3.5	3.0	3.1	3.2		
	I. Includes the storage industry which, in 1996 in Canada, accounted for 1/10 of 1 per cent.      Source: OECD National Accounts, 1981 – 1996								

terms. On a modal basis, truck and rail have shown the largest increase with 9.3 and 9.0 per cent respectively, followed by air and marine with 5.9 and 3.2 per cent. Table 2-3 shows how transportation's GDP has improved.

In many OECD countries, including Canada, the transportation sector has been growing at a slower rate than total GDP. Overall, the ratio of transportation GDP to total GDP has fallen, due to higher productivity and lower prices. Wages, profits, interest payments and rent in transportation have increased at a slower rate than the average increase in the economy. This has translated into a relative decline in the overall cost of transportation, compared with costs in the economy. Consequently, transportation's share of the economy has declined.

Table 2-4 compares how much transportation has contributed to the overall economy, or the ratio of transportation GDP to total GDP, for Canada and selected major industrialized countries over the last 15 years.

## TRANSPORTATION AS AN EMPLOYER

In 1997, transportation employed approximately 472,000 people, with twice as many people in road than in all other modes combined. At least that many more people are also indirectly dependent on the transportation sector for employment. In fact, transportation accounts for 3.4 per cent of all jobs in Canada. Trucking is the biggest employer, with 158,000 jobs, and marine is the smallest, with 31,000.

TABLE 2-5 TRANSPORTATION EMPLOYMENT BY MODE 1992 and 1997							
	(Thousands of emp	oloyees)					
Mode	1992	1997	1992-971				
Truck	113	158	6.9				
Air	59	71	3.8				
Rail	60	50	-3.6				
Water	23	31	6.2				
Urban	79	84	1.2				
Other <sup>2</sup>	75	78	0.8				
Total	409	472	2.9				
	Average annual per cent change     Includes taxis, inter-urban and other modes						
Source: Statistics Canada,	, Cat. 72-002; Transport Canada						

TABLE 2-6 INVESTMENT IN TRANSPORTATION 1992 – 1995							
	(Millions of cur	rent dollars	)				
	1992	1993	1994	1995	Average	%	
Total investment Government construction Government machinery	<b>85,045</b> 12,691 3,415	<b>85,803</b> 12,325 3,491	<b>93,356</b> 13,559 3,508	<b>96,353</b> 14,456 3,332	,	100.0 14.7 3.8	
Business construction Business machinery and equipment	29,734 39,205	30,162 39,825	32,962 43,327	32,213 46,352	31,268 42,177	34.7 46.8	
Total transport Equipment Infrastructure	<b>14,670</b> 9,199 5,471	<b>15,155</b> 9,651 5,504	<b>18,754</b> 12,342 6,412	<b>19,716</b> 12,876 6,840	<b>17,074</b> 11,017 6,057	18.9 12.2 6.7	
Road Equipment (e.g. cars) Roads and bridges	<b>12,401</b> 7,705 4,696	<b>13,321</b> 8,493 4,828	<b>16,375</b> 11,033 5,342	<b>17,454</b> 11,632 5,822	<b>14,888</b> 9,716 5,172	<b>16.5</b> 10.8 5.7	
Rail Equipment (e.g. locomotives) Rail Track and roadbeds	<b>583</b> 288 295	<b>761</b> 401 360	<b>866</b> 379 487	<b>845</b> 356 489	<b>764</b> 356 408	<b>0.8</b> 0.4 0.5	
Marine Equipment (e.g. ships) Marine engineering construction	<b>722</b> 308 414	<b>510</b> 267 243	<b>678</b> 186 492	<b>719</b> 274 445	<b>657</b> 259 399	<b>0.7</b> 0.3 0.4	
Air Equipment (e.g. aircraft) Runways including lighting	<b>964</b> 898 66	<b>563</b> 490 73	<b>835</b> 744 91	<b>698</b> 614 84	<b>765</b> 687 79	<b>0.8</b> 0.8 0.1	
Source: Statistics Canada, Cat. 61-223							

	TABLE	2-7	
TOTAL TI	RANSP	ORT D	EMAND
1	991 and	1 1996	

1991 and 1996								
(Millions of current dollars) ————————————————————————————————————								
	Billions of	\$ %Share	Billions of	\$ %Share	AA%C*			
(A) Final domestic demand	693.1	100.0	788.1	100.0	2.6			
Aggregate domestic spending on transportation								
(B) Total (Items 1+2+3)	108.5	15.7	134.2	17.0	4.3			
(C) Total less indirect taxes and fees (Items 1+2+5)	98.5	14.2	122.8	15.6	4.5			
1) For-hire carriers	26.9	3.9	35.3	4.5	5.6			
Air	7.8	1.1	9.7	1.2	4.3			
Rail	5.3	0.8	6.2	0.8	3.2			
Water	2.3	0.3	4.0	0.5	12.1			
Truck	8.0	1.2	12.0	1.5	8.5			
Urban transit	1.4	0.2	1.2	0.2	-2.7			
Other	2.1	0.3	2.2	0.3	0.8			
2) Private transport sales	64.4	9.3	83.1	10.5	5.2			
Retail vehicle dealers (new and used)	36.9	5.3	52.2	6.5	7.2			
Gasoline service stations	14.0	2.0	16.1	2.0	2.9			
Retail vehicle parts and repair shops	10.8	1.6	12.1	1.5	2.4			
Vehicle rental agencies	2.8	0.4	2.6	0.3	-1.2			
3) Government expenditures	17.1	2.5	15.8	2.0	-1.6			
Road construction and maintenance	10.9	1.6	11.0	1.4	0.2			
Urban transit subsidies	2.4	0.3	2.5	0.3	1.5			
Other net transfers and subsidies	3.9	0.6	2.3	0.3	-10.1			
4) Total indirect taxes and fees	10.0	1.4	11.4	1.4	2.6			
Fuel taxes	7.7	1.1	8.8	1.1	2.6			
Licence fees	2.3	0.3	2.6	0.3	2.5			
5) Government expenses less indirect taxes and fe	es 7.1	1.0	4.4	0.6	-9.0			
AA%C: Average annual per cent change								
Source: Statistics Canada, Special tabulation from the National Accounts and Envi	rironment Division							

Source: Statistics Canada, Special tabulation from the National Accounts and Environment Division, Several annual reports of transportation companies; Transport Canada

Since 1992, changes in the number of jobs in transportation have varied greatly between the modes. Total employment increased by 63,000 jobs. The largest increase, in both relative and absolute terms since 1992, occurred in trucking – an increase of 45,000 jobs. Air employment increased by 12,000 and water by 8,000. Streamlining of rail operations has cut 10,000 jobs over the last five years.

Table 2-5 displays the growth and decline in employment in the

transportation sector, mode by mode.

#### INVESTMENT

Investment in transportation includes government spending on transportation infrastructure, such as building roads; and business and government spending on machinery and equipment, such as cars and trucks. In transportation, investment usually occurs at irregular intervals and involves large sums of money.

From 1992 to 1995, transportation investment accounted for 18.9 per cent of total investment in the economy in an average year, with equipment accounting for 12.2 per cent and infrastructure for 6.7 per cent. Significantly, road dominates investment in transportation, accounting for 16.5 of the 18.9 per cent, while all other modes accounted for less than one per cent each. Table 2-6 compares investment in transportation to investment in the economy (less residential construction, which is considered a non-productive investment).

#### TRANSPORTATION DEMAND

In 1996, the domestic demand for transportation represented 17 per cent of Canadians' total domestic demand, an increase from the 15.7 per cent in 1991, reflecting an annual growth rate of 4.5 per cent (Table 2-7). This rate exceeded the growth rate for overall demand, which explains transportation's increasing share of total domestic demand. If total indirect taxes and fees are subtracted from government expenditures, aggregate domestic spending on transportation in 1996 would represent 15.6 per cent of total domestic demand, compared to 14.2 per cent in 1991.

Domestic demand for transportation is composed of many segments, the largest being private transportation sales, which accounted for 10.5 per cent of total domestic demand in 1996. The largest component of private transportation sales – retail vehicle sales – accounted for 6.5 per cent of overall demand, while the other components – gasoline service stations, retail vehicle parts and repairs, and rental agencies – accounted for two, 1.5 and 0.3 per cent, respectively.

The second largest segment of domestic demand in 1996 was for-hire carriers, representing 4.5 per cent of overall demand. Trucking was the most significant sub-segment, at 1.5 per cent, followed by air at 1.2 per cent, while all other modes were less than one per cent each. Except for rental agencies, the components of private transportation sales were larger than or equal to any individual mode in the for-hire carriers group.

The demand for urban transit is declining steadily, reflecting the ongoing trend of using private vehicles.

TABLE 2-8
AVERAGE ANNUAL SPENDING ON TRANSPORT, PER HOUSEHOLD
1997

Item	\$/Household	Percentage
Vehicle purchase	3,071	46.1
New cars and trucks	2,178	32.7
Used cars and trucks	602	9.0
Bicycles and motorcycles	207	3.1
Boats, aircraft	84	1.3
Fuel	1,297	19.5
Insurance	300	4.5
Other vehicle operating expenses	830	12.5
Repairs and maintenance	439	6.6
Parts and accessories	391	5.9
Other	320	4.8
Motor vehicle rental/lease	64	1.0
Parking	61	0.9
Driving lessons, licence fees	195	2.9
Urban public transportation	168	2.5
Transit	129	1.9
Taxi	39	0.6
Intercity public transportation	669	10.1
Air	577	8.7
Rail	14	0.2
Intercity bus	52	0.8
Ferry and water transportation	26	0.4
Total	\$6,655	100.0

Source: Statistics Canada, Special tabulation from the National Accounts and Environment Division;
Transport Canada

Government accounted for the smallest segment of domestic demand for transportation, at two per cent of total domestic demand in 1996. The largest subsegments were road construction and maintenance, at 1.4 per cent, with urban transit subsidies and other subsidies and administration at 0.3 per cent each.

## HOUSEHOLD SPENDING ON TRANSPORTATION

The dependence of the average Canadian consumer on transportation is another indicator of the sector's importance. In 1997, the average household spent 15.2 per cent of its budget on transportation, of which over 80 per cent was put towards buying

and using an automobile. The average Canadian household also spent 12.6 per cent of its transportation budget on public transportation. Air dominated this spending, accounting for 68.9 per cent of the budget. Table 2-8 itemizes the transportation budget for the average household, including the item purchased, the cost, and what percentage of the total budget the item accounts for.

#### Transportation and Trade

The transportation system plays a critical role in Canada's trade, both domestically and internationally. As

TABLE 2-9
INTERPROVINCIAL AND INTERNATIONAL TRADE FLOWS OF TOTAL GOODS
1989 – 1996

				('	1988=100)					
Year	Intra- Regional	Inter- Regional	Exports to US	Exports to ROW	Imports from US	Imports from ROW	Total flows	Domestic flows	Total production	Total demand
1989	107	105	101	107	104	110	106	107	106	107
1990	107	98	108	99	103	115	106	105	105	106
1991	99	88	106	86	102	116	100	97	98	99
1992	96	86	121	84	113	123	103	94	99	100
1993	99	83	146	84	134	131	111	96	105	106
1994	106	84	176	98	162	145	124	102	116	116
1995	109	88	200	131	178	161	135	105	125	122
1996	111	95	214	133	185	167	140	108	130	127
ROW:	Rest of the World									
Source:	Statistics Canada; Transp	port Canada								

	TABLE 2-10 INTERPROVINCIAL AND INTERNATIONAL TRADE FLOWS OF TOTAL GOODS 1988 – 1996											
Year	Intra- Regional	Inter- Regional	Exports to US	Exports to ROW	Imports from US	Imports from ROW	Total	Total Trade Balance	Trade Balance with US	Trade Balance with ROW	Total Exports	Total Imports
1988	46.8	11.3	15.2	5.7	13.1	8.0	100	-0.3	2.1	-2.3	20.8	21.1
1989	47.3	11.2	14.5	5.7	12.9	8.3	100	-0.9	1.7	-2.6	20.3	21.2
1990	47.3	10.5	15.5	5.3	12.8	8.7	100	-0.7	2.7	-3.4	20.8	21.4
1991	46.4	10.0	16.1	4.9	13.3	9.3	100	-1.7	2.8	-4.4	21.0	22.6
1992	43.8	9.5	18.0	4.6	14.5	9.6	100	-1.5	3.5	-5.0	22.6	24.1
1993	41.9	8.5	20.0	4.3	15.9	9.4	100	-1.0	4.1	-5.1	24.3	25.3
1994	39.9	7.6	21.6	4.5	17.1	9.3	100	-0.4	4.5	-4.8	26.1	26.4
1995	37.7	7.4	22.5	5.5	17.3	9.6	100	1.2	5.2	-4.0	28.1	26.9
1996	37.1	7.6	23.2	5.4	17.2	9.5	100	1.8	5.9	-4.2	28.5	26.7
ROW:	ROW: Rest of the World											
Source:	Source: Statistics Canada; Transport Canada											

TABLE 2-11 SHARE OF TRADE FLOWS IN TOTAL PRODUCTION OF GOODS 1988 – 1996										
	(In per cent of total value of production)									
Year	Intra- Regional	Inter- Regional	Exports to US	Exports to ROW	Total					
1988	59.2	14.3	19.2	7.2	100					
1989	60.0	14.3	18.5	7.3	100					
1990	60.2	13.3	19.7	6.7	100					
1991	59.9	12.9	20.8	6.3	100					
1992	57.7	12.5	23.7	6.1	100					
1993	56.1	11.4	26.7	5.7	100					
1994	54.2	10.4	29.3	6.1	100					
1995	51.6	10.1	30.8	7.5	100					
1996	50.6	10.4	31.6	7.3	100					
	of the World stics Canada; Transpo	ort Canada								

CANA	ADIAN M	ERCHAN	ABLE 2-1 DISE EX 088 - 199	PORTS	BY COU	NTRY		
		(Billions	of curren	nt dollars)				
1988	1989	1990	1991	1992	1003	1001	1005	100

(Billions of current dollars)										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
US	100.9	101.6	111.6	109.7	125.7	150.7	184.2	209.9	223.5	244.9
Japan	8.8	8.8	8.2	7.2	7.5	8.5	9.7	12.1	11.2	10.9
Mexico	8.5	0.6	0.7	0.6	0.8	0.8	1.1	1.1	1.3	1.3
Other APEC*	8.4	7.7	7.8	8.4	8.1	8.0	10.2	14.3	13.2	13.2
European Union	11.9	12.5	12.8	12.2	12.2	11.5	12.5	16.6	15.7	15.0
Other	8.0	7.5	7.9	7.9	8.5	8.0	8.8	10.3	11.0	11.6
TOTAL	138.5	138.7	149.0	146.0	162.8	187.5	226.5	264.3	275.9	296.9

<sup>\*</sup> Note: Other Asia Pacific Economic Cooperation forum includes Australia, Brunei, Chili, China, Hong Kong, Indonesia, Republic of Korea, Malaysia, New Zealand, Papua New Guinea, Philippines, Singapore, Chinese Taipei, Thailand and Peru (Canada, the US, Mexico and Japan are also members of APEC).

Source: Statistics Canada, Cat. 65-202, 65-004; 1997 is an estimate

	TABLE 2-13 CANADIAN MERCHANDISE IMPORTS BY COUNTRY 1988 – 1997										
(Billions of current dollars)											
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
US	86.0	88.1	87.9	86.4	96.5	113.8	137.3	150.8	157.5	183.4	
Japan	9.3	9.6	9.5	10.3	10.8	10.7	11.4	12.1	10.4	12.5	
Mexico	1.3	1.7	1.7	2.6	2.8	3.7	4.5	5.4	6.0	7.0	
Other APEC*	9.3	9.9	9.8	10.3	11.8	14.0	16.4	18.9	18.7	21.7	
European Union	17.6	16.6	17.3	16.0	15.8	16.3	19.6	22.6	22.7	26.8	
Other	7.7	9.3	10.0	9.9	10.3	11.5	13.5	15.8	17.8	20.1	
TOTAL	131.2	135.2	136.2	135.5	148.0	170.0	202.7	225.6	233.1	271.5	

<sup>\*</sup> Note: Other Asia Pacific Economic Cooperation forum includes Australia, Brunei, Chili, China, Hong Kong, Indonesia, Republic of Korea, Malaysia, New Zealand, Papua New Guinea, Philippines, Singapore, Chinese Taipei, Thailand and Peru (Canada, the US, Mexico and Japan are also members of APEC).

Source: Statistics Canada, Cat. 65-203, 65-001; 1997 is an estimate

an open economy, Canada relies on transportation to get goods to foreign markets.

Transportation is also important for domestic trade. In addition to trade within each province, trade between provinces is vital to regional economies. Each province is unique in its economic makeup, with its own specific industrial structure. Where one may be dominated by natural resources, the other may be dominated by specific manufacturing activities, making transportation a crucial link.

In recent years, the flow of commodities has altered significantly. For the purposes of comparison, it is useful to look at domestic trade flows versus international trade flows. Total flows increased by 40 per cent between 1988 and 1996. During the same period, the total output of goods (intra-regional and interregional flows plus exports) increased by 30 per cent, while domestic demand (intra-regional and inter-regional flows plus imports) increased by 27 per cent.

Domestic flows saw an increase of eight per cent between 1988 and 1996, the result of an 11 per cent increase in intra-regional traffic and a five per cent decrease in inter-regional movements of goods. Clearly, domestic transportation activities have not benefited from the increases registered in domestic production and demand. The gains have come mainly from international trade. Table 2-9 shows the flow of trade between 1989 and 1996.

TABLE 2-14
SHARE OF CANADIAN MERCHANDISE TRADE*
1988 and 1997

1300 una 1001										
(In p	per cent)									
FxI	oorts	Imports								
1988	1997	1988	1997							
72.9	82.5	65.6	67.5							
6.4	3.7	7.1	4.6							
0.4	0.4	1.3	2.6							
5.6	4.4	7.3	8.0							
8.6	5.1	12.4	9.9							
6.1	3.9	6.3	7.4							
100.0	100.0	100.0	100.0							
	(In p. 1988) 72.9 6.4 0.4 5.6 8.6 6.1	72.9 82.5 6.4 3.7 0.4 0.4 5.6 4.4 8.6 5.1 6.1 3.9	(In per cent) Exports Implies 1988 1997 1988 72.9 82.5 65.6 6.4 3.7 7.1 0.4 0.4 1.3 5.6 4.4 7.3 8.6 5.1 12.4 6.1 3.9 6.3							

\* Note: Other Asia Pacific Economic Cooperation forum includes Australia, Brunei, Chili, China, Hong Kong, Indonesia, Republic of Korea, Malaysia, New Zealand, Papua New Guinea, Philippines, Singapore, Chinese Taipei, Thailand and Peru (Canada, the US, Mexico and Japan are also members of APEC)

Source: Statistics Canada, Cat. 65-202 and 65-203

TABLE 2-15
CANADIAN EXPORTS AND IMPORTS BY TRANSPORT MODE
1996

Exports*	(\$B) (%)	Road 125.2 48.3	Rail 50.7	Water 43.8 16.9	<i>Air</i> 15.8 6.1	Other 24.0 9.3	Total 259.4 100.0
Imports	(\$B)	145.3	16.6	38.5	29.8	2.9	233.1
	(%)	62.3	7.1	16.5	12.8	1.2	100.0

<sup>\*</sup> Does not include re-exports. At this detailed level, data for 1997 not yet available. Source: Statistics Canada, Cat. 65-202 and 65-203

Since 1988, Canada's exports of goods to the US have increased by 114 per cent, while exports to the rest of the world have increased by 33 per cent. Similarly, Canada's imports of goods from the US have risen by 85 per cent, while imports from the rest of the world have increased by 67 per cent.

Canada's trade traffic with the US is the most significant. In 1988, Canada's export business to the US represented 15 per cent of all goods moved in Canada – today, that figure is at 23 per cent. Similarly, our import business from the US has risen from 13 to 17 per cent of total traffic. Table 2-10 illustrates these trade levels. Between 1988 and 1996, Canada moved fewer goods within regions, and the share

of intra-regional trade fell from 47 to 37 per cent of total trade activity. Likewise, the share of trade movements between regions also declined, from eleven to eight per cent of the total.

Relative importance of trade can be measured in terms of domestic production, that is, domestic flows plus exports to the US and the rest of the world. The share of intraregional trade dropped from 59 to 51 per cent of Canadian production of goods, while interregional traffic fell from 14 to ten per cent of production. While overseas exports maintained their share at seven per cent, US exports rose from 19 to 32 per cent. Table 2-11 shows these traffic shares of total output.

Canada exports close to 40 per cent of what it produces, and imports slightly less than it exports. Over the past decade, these proportions have almost doubled, which demonstrates that growth of the Canadian economy is directly related to our participation in the global economy.

Since 1988, total exports have increased by 8.8 per cent per year in current dollars. Exports to the US more than doubled. Table 2-12 illustrates these changes in Canada's exports.

During the same period, imports grew at 8.4 per cent per year. Notably, imports from countries other than the US, the European Economic Community and Japan more than doubled. Table 2-13 illustrates these changes in Canada's imports.

The US is by far Canada's major trading partner. Trade with the US features access to the world's largest market. For this trade, shippers, receivers and business people can benefit from the two countries' increasingly integrated transportation systems.

In 1997, the US alone received 83 per cent of Canada's merchandise exports, compared to 73 per cent just ten years earlier. Over the same period, the share of Canadian imports from Europe and Japan dropped, benefiting the US and the rest of the world. In 1997, over two thirds of our imported goods came from the US. Table 2-14 charts Canada's merchandise trade.

Almost half of Canada's exports were shipped by road. Rail accounts for 20 per cent, followed by water at 17 per cent and air at six per cent. For imports, road is by far the most used method of shipping, at 62 per cent, followed

by water and air with 17 and 13 per cent respectively. Table 2-15 shows by which mode Canada's trade was moved.

For exports, transportation equipment is the largest commodity group. Within that group, automobiles are the single most important export good, followed by fabricated materials and electrical equipment. Most of the goods were shipped by road, although rail moved about 26 per cent, mostly transportation equipment and fabricated materials. Table 2-16 shows Canada's exports to the US and Mexico by major commodity grouping and mode.

For imports, transportation equipment is again the largest commodity grouping at 32 per cent. Almost 80 per cent of imports enter Canada by road and less than ten per cent by rail. Table 2-17 shows Canada's imports from the US and Mexico by major commodity grouping and mode.

The two largest provinces, Ontario and Quebec, dominate provincial trade with our NAFTA partners, the US and Mexico, and account for almost 75 per cent of exports and 83 per cent of imports. Because foreign trade is so critical to Canada's economic growth, an efficient, affordable transportation system is essential to help Canada compete globally. In fact, without its transportation system, Canada would not have undergone the growth it has experienced in recent years. Table 2-18 shows Canada's merchandise exports to and imports from the US and Mexico by province in 1996.

TABLE 2-16
CANADA'S MERCHANDISE EXPORTS TO THE US AND MEXICO
BY MAJOR COMMODITY GROUPING AND BY MODE
1996

	Billions of current dollars	Per cent total Exports	Per cent moved by Road	Per cent moved by Rail
Live animals	1.9	0.9	99.8	0.0
Crude materials	13.7	6.8	72.4	12.1
Fabricated materials	62.7	31.0	55.8	34.6
End products	9.8	4.9	92.7	2.2
Transportation equipment	70.4	34.8	57.2	39.5
Electric equipment	23.6	11.7	80.2	0.7
Other	20.0	9.9	87.7	2.0
Total	202.1	100.0	65.6	25.7

Note: Based on exports to the US and Mexico. Excludes electricity and pipelines. At this detailed level, data for 1997 not yet available.

Source: Statistics Canada, Cat. 65-202 and 65-203

# TABLE 2-17 CANADA'S MERCHANDISE IMPORTS FROM THE US AND MEXICO BY MAJOR COMMODITY GROUPING AND BY MODE 1996

	Billions of current dollars	Per cent total Imports	Per cent moved by Road	Per cent moved by Rail
Live animals	0.1	0.1	94.4	0.0
Crude materials	13.3	8.2	80.1	9.4
Fabricated materials	31.9	19.7	79.7	12.3
End products	14.0	8.6	92.5	1.9
Transportation equipment	52.2	32.1	76.4	18.7
Electric equipment	32.9	20.3	74.3	1.0
Other	17.9	11.0	89.0	0.7
Total	162.3	100.0	79.7	9.6

Note: Based on imports from the US and Mexico. Excludes electricity and pipelines. At this detailed level, data for 1997 not yet available.

Source: Statistics Canada, Cat. 65-202 and 65-203

# TABLE 2-18 CANADA'S TRADE WITH THE US AND MEXICO BY PROVINCE, 1996

(Billions of current dollars)									
		Atlantic	Quebec	Ontario	Prairies	BC*	Total		
Exports from	(\$B)	8.4	39.9	127.8	35.0	14.5	225.6		
	(%)	3.7	17.7	56.7	15.5	6.5	100.0		
Imports to	(\$B)	2.1	17.2	118.8	14.7	11.2	164.0		
	(%)	1.3	10.5	72.7	9.0	6.5	100.0		

Note: Based on trade between Canada and the US and Mexico.

\* Includes Territories. At this detailed level, data for 1997 not yet available.

Source: Statistics Canada, Cat. 65-202 and 65-203

# INTERNATIONAL TRANSPORTATION INITIATIVES

Canada is one of 18 member economies of the Asia Pacific Economic Co-operation (APEC) Forum, formed in 1989 to promote open trade, investment and technical co-operation in the Asia Pacific region. While it is not a negotiating forum, APEC supports the work of the World Trade Organization. A unique aspect of APEC is its emphasis on private sector participation.

For Canada, 1997 was a banner year. In November, Canada chaired the APEC Forum in Vancouver, British Columbia. In addition to hosting the Trade and Foreign Ministers' Meeting and the APEC Leaders' Meeting, Canada hosted five sectoral Ministerial Meetings, including one on transportation.

Canada is active in the APEC Transportation Working Group. This group supports regional economic growth by promoting an effective, integrated region-wide transportation system. In June 1997, Canada hosted the second APEC Transportation Ministerial in Victoria, British Columbia. Seventeen APEC partners participated, sending 500 official delegates, including some 180 senior business and industry representatives.

#### APEC Initiatives Completed in 1997

At the June meeting, the collective Ministers of Transport accepted the Report of the Group of Experts on Aviation Safety and Assistance (GEASA), including the civil aviation safety recommendations. The Ministers also signed the Declaration of Principles, which supports the harmonization of Civil Aviation Safety Rules with International Civil Aviation Organization (ICAO) standards. The APEC region's unprecedented growth and the globalization of air transportation may lead to civil aviation safety issues, which the GEASA report addresses. With Canada taking the lead for its development, the GEASA report was based on a survey, review and prioritization of safety issues. It includes specific recommendations related to air travel safety in all APEC economies.

In addition, the Ministers endorsed the Joint Policy Statement on Satellite Navigation and Communications Systems, which calls for a series of co-operative actions to implement communications systems, and establishes an Advisory Committee to monitor those actions. Spearheaded by Canada, the policy statement grew out of a comprehensive study of integrated satellite-based navigation and communication systems, in order to facilitate their implementation in both the air and marine modes within the APEC region. A complement to the work of the ICAO and International Marine Organization (IMO), the study consisted of a technology review, an inventory of plans and issues, an economic assessment and policy recommendations.

The Australian-led Model Mutual Recognition Arrangement (MRA) for Automotive Products was endorsed by the Ministers. A tool to facilitate trade, the MRA promotes bilateral or multilateral agreements between APEC members. It is a component of the Road Transport Harmonization project, a multi-phased initiative that promotes harmonized standards within APEC.

The Ministers signed off on the Best Practices Manual and Technical Report, Volumes 1 and 2, for eliminating traffic congestion points. Led by the US, the report represents the third and final phase of the Transportation Congestion Points Study undertaken by the APEC Transportation Working Group. The study researched the location and nature of transportation bottlenecks at airports, seaports and land access points in the APEC Region caused by increasing demands placed upon existing infrastructure. It also included solutions and best practices to resolve those bottlenecks.

Finally, the Ministers endorsed the Options Paper on More Competitive Air Services with Fair and Equitable Opportunity. The paper identified options for future action and directed that a comprehensive final report be submitted to Ministers by mid-1998.

#### APEC Initiatives Launched in 1997 under Ministerial Request

The Canadian-led Transportation Working Group established the Maritime Safety Experts Group. The group will develop programs and mechanisms to promote the implementation of, and compliance with, existing international rules and standards adopted by these organizations. Ministers also urged APEC members to work closely with international maritime safety experts, such as the IMO.

The APEC Transportation Working Group also set up the Road Safety Experts Group as a first step toward enhancing road safety in the APEC Region.

In addition, a Maritime Initiative was established to promote an efficient, safe and competitive operating environment for maritime transportation. The first project will take an inventory of restrictive and discriminatory measures in the international maritime sector.

The Transportation Working Group will also set up a framework of standards for the initial application of Intelligent Transportation Systems for vehicle identification, safety, location and tolling.

And finally, building upon identified best practices from the Transportation Congestion Points Study, an Intermodal Task Force was set up to provide guidelines, standards and provisional options associated with an integrated transportation system.

# TRANSPORTATION AND REGIONAL ECONOMIES

Regions which have increased their trade activities have also seen an increase in the relative share of transport activities in their economy.

The transportation industry is as important to regional economies as it is to the national economy. In each province, transportation plays two roles: one as an intermediary industry (for example, moving goods from factories to stores), and another as a contributor to economic consumption (for

example, moving people to and from shopping centres). An efficient provincial economy requires a balance between supply and demand for transportation.

Four indicators provide clues to the transportation industry's importance to provincial economies: the value-added 1 that for-hire<sup>2</sup> carriers contribute; the employment that for-hire carriers create; total transportation demand<sup>3</sup>; and investment<sup>4</sup> by business and government in transportation infrastructure and machinery.

The value-added of for-hire carriers can be compared to provincial gross domestic product

<sup>1 &</sup>quot;Value-added" is an economic concept used for measuring the importance of an industry's production within an economy. In the context of this chapter, it refers to payments such as wages and profits made to the principal factors employed in production throughout the provincial economy, with the principal factors being labour and capital. Since value-added is determined by payments to labour and capital, using this concept means that the importance of transport to provincial economies is determined by the location of the workers and capital employed by for-hire carriers. Value-added is a measure of the production or supply of transport.

<sup>2 &</sup>quot;For-hire" carriers can be defined as industries that transport goods and/or passengers for a fee. They form part of "total transport," which also includes private spending on transport, such as consumer purchases of cars, and government expenditures on transport, such as highway maintenance and construction.

<sup>3 &</sup>quot;Total transport demand" measures transport sales to consumers, businesses and governments within the province. In contrast to value-added, total transport demand includes private and government expenditures on transport, as well as sales of for-hire carriers.

<sup>4</sup> Whether made by business or government, "transport investment" can be defined as both new infrastructure construction and purchases of new machinery and equipment. It does not include repair and maintenance expenditures, which are expenditures on existing infrastructure, machinery and equipment. In this chapter, a distinction is made between investment in infrastructure such as roads, and investment in equipment. Transport infrastructure investment is broken down into four categories: road, rail, marine and air.

TABLE 3-1 STRUCTURE OF REGIONAL ECONOMIES **EASTERN CANADA PROVINCES** 

(Per cent)									
	NF	LD `	P	EI	NS		NB		
	Share 1996	AAG 91-96	Share 1996	AAG 91-96	Share 1996	AAG 91-96	Share 1996	AAG 91-96	
Provincial GDP	100.0	0.0	100.0	2.7	100.0	0.9	100.0	1.8	
Primary commodities	6.7	0.0	10.6	3.2	4.9	0.6	5.1	1.0	
Manufacturing and construction	13.8	-2.3	16.0	6.2	17.3	-1.3	21.4	2.9	
Utilities and trade	26.2	1.2	22.8	3.2	25.4	3.3	27.1	2.9	
Finance and services	60.1	-0.1	57.8	1.8	59.7	0.7	53.0	1.0	
Government services	10.7	-1.8	10.3	-1.5	10.1	-2.3	8.9	-0.6	
Other finance and services	49.4	0.3	47.5	2.7	49.6	1.5	44.1	1.3	

AAG: Average annual growth

Source: Statistics Canada, Cat. 15-203-XPB, Provincial Gross Domestic Product by Industry, 1984–96

TABLE 3-2									
TRADE	OF	<b>EASTERN</b>	CANADA	<b>PROVINCES</b>					

(Per cent)									
	NFI	NFLD PEI			NS	3	N	В	
	Share PGDP 1996	AAG 91-96	Share PGDF 1996	91-96	Share PGDP 1996	AAG 91-96	Share PGDP 1996	AAG 91-96	
Interprovincial exports	9.9	-0.2	29.6	6.8	21.8	4.1	29.2	5.9	
- Interprovincial imports	41.6	0.6	47.6	2.8	34.8	0.5	40.3	2.9	
Interprovincial Balance	-31.8	8.0	-18.1	-1.7	-12.9	-3.7	-11.2	-2.5	
International exports	30.1	8.8	16.7	11.1	20.1	4.9	35.4	15.7	
- International imports	21.9	7.9	14.4	7.2	27.1	4.8	36.8	14.7	
International Balance	8.1	11.8	2.3	227.6	-7.0	4.5	-1.4	0.8	
Total exports	39.9	5.9	46.3	8.2	42.0	4.5	64.6	10.5	
- Total imports	63.5	2.6	62.0	3.7	61.9	2.2	77.1	7.4	
Total Trade Balance	-23.6		-15.7		-19.9		-12.6		

AAG: Average annual growth PGDP: Provincial gross domestic product

Source: Statistics Canada System of National Accounts Division, Input-Output section

# TABLE 3-3 IMPORTANCE OF COMMERCIAL TRANSPORTATION TO EASTERN PROVINCES

(Per cent)										
	NFI			El	NS	3	N	NB		
	Share PGDP 1996	AAG 91-96								
Commercial Transportation	3.7	4.8	2.9	-1.4	4.0	5.6	5.6	7.4		
Air	0.9	18.0	0.3	13.3	0.4	3.4	0.1	8.5		
Rail	0.8	5.9	0.0	0.0	0.5	0.9	0.9	0.9		
Water	0.6	-1.1	0.5	0.0	0.4	-1.5	0.4	-2.8		
Truck	1.1	2.7	1.4	0.3	2.3	11.7	3.8	14.0		
Urban transit	0.0	-3.0	0.0	0.0	0.1	-3.0	0.0	-3.8		
Other transport*	0.3	1.3	0.8	-6.2	0.3	0.0	0.3	-3.8		

\* "Other transport" refers primarily to travel agencies and tour operators, taxis, and intercity and charter bus operators.

AAG: Average annual growth PGDP: Provincial gross domestic product

Source: Statistics Canada, Transport Canada estimates

(PGDP) – the standard measure of a province's total value of production. Total transportation demand can be compared to a province's final domestic demand (PFDD), a measure of the total amount of sales in the provincial economy. These two economic concepts are related in that PGDP is equal to PFDD plus the trade balance, where the trade balance includes both interprovincial and international trade.

Canada's provinces are grouped here into three regions: Eastern, including Newfoundland, Prince Edward Island, Nova Scotia and New Brunswick; Central, including Quebec and Ontario; and Western, including Manitoba, Saskatchewan, Alberta, British Columbia and the Territories. This section will follow that order.

# VALUE-ADDED OF TRANSPORTATION

The importance of for-hire carriers to provincial economies, and the transport mode that predominates in each province, is primarily determined by the province's geography, its economic structure and its interprovincial and international trade. Public transportation policy also has an influence.

The principal policies that have recently affected transportation's contribution to provincial economies are deregulation (for example, of the trucking industry) and commercialization or privatization of transportation infrastructure (for example, of airports).

Location is another determinant of the importance of for-hire carrier transportation to certain provincial economies. For example, provinces that border on Quebec or Ontario can act as hubs for transportation entering or leaving Central Canada.

Both Manitoba and New Brunswick exhibit the largest share of carrier transportation relative to the provincial economies of their respective regions. British Columbia also has a large carrier share, a result of its suitability as a staging area for trade with the Pacific Rim countries.

# **EASTERN CANADA**

New Brunswick, Nova Scotia. Prince Edward Island and Newfoundland have the smallest provincial economies. In each of these provinces, financial and other services (particularly government services) provide a relatively high contribution to the provincial economy, while the contribution of primary commodity production is moderately important. Another characteristic of these economies is the moderate rate at which they have grown. Table 3-1 shows the industrial structure of the provinces in the Eastern region, as well as their percentage of PGDP in 1996 and their annual growth from 1991 to 1996.

In terms of international and interprovincial trade, the economies of these provinces are characterized by large total-trade deficits, generated by large shares of imports, primarily manufactured goods, in each province.

The total-trade deficits are primarily generated by trade

deficits in interprovincial trade, which occur principally with Ontario and Quebec. In Eastern Canada, the trend has been toward reducing trade deficits in both interprovincial and total trade – export growth exceeding import growth from 1991 to 1996.

Table 3-2 illustrates trade in the Eastern region and its contribution to PGDP and annual growth from 1991 to 1996.

Four factors are generating moderately higher shares of for-hire transportation activities in Eastern Canada: the relatively large distance from markets in Central Canada; the geographic dispersion of the population relative to Central Canada; the high share of imports; and the moderate levels of primary commodity production.

As New Brunswick is the nearest Eastern province to both Central Canada and the United States, it acts as a staging area or hub for transportation to and from Eastern Canada. Consequently, New Brunswick enjoys the highest for-hire carrier share of all the Eastern Canadian provinces, and the second highest share (after Manitoba) of all provinces. New Brunswick exhibits the largest growth in for-hire carrier transportation activities of all provinces.

In each Eastern province, trucking is the most important mode of for-hire carrier transportation, with particularly high growth rates in Nova Scotia and New Brunswick. Rail is the second largest mode in all provinces, except Prince Edward Island and Newfoundland. <sup>5</sup>

<sup>5</sup> The share of rail in Newfoundland may be unrepresentative. The sole railway in Newfoundland is located in Labrador, where it transports iron ore from Labrador to Quebec for processing on the north shore of the St. Lawrence River. Neither the islands of Newfoundland or Prince Edward Island have railways.

## TABLE 3-4 STRUCTURE OF REGIONAL ECONOMIES CENTRAL CANADA PROVINCES

er cent)	UE	ONT			
Share 1996	AAG 91-96	Share 1996	AAG 91-96		
100.0	1.8	100.0	2.2		
3.1	1.0	2.5	1.5		
26.4	1.4	29.5	3.2		
25.0	3.2	23.2	3.6		
52.0	1.5	50.4	1.1		
6.3	-0.6	5.2	-1.5		
45.6	1.9	45.1	1.5		
	Share 1996 100.0 3.1 26.4 25.0 52.0	Share AAG 1996 91-96 100.0 1.8 3.1 1.0 26.4 1.4 25.0 3.2 52.0 1.5 6.3 -0.6	Share         AAG         Share           1996         91-96         1996           100.0         1.8         100.0           3.1         1.0         2.5           26.4         1.4         29.5           25.0         3.2         23.2           52.0         1.5         50.4           6.3         -0.6         5.2		

AAG: Average annual growth

Source: Statistics Canada, Cat. 15-203-XPB, Provincial Gross Domestic Product by Industry, 1984-96

# TABLE 3-5 TRADE OF CENTRAL CANADA PROVINCES

	(Per cent)	ONT			
	Share PGDP 1996	AAG 91-96	Share PGDF 1996	91-96	
Interprovincial exports	19.7	2.0	19.9	3.0	
- Interprovincial imports	19.9	4.6	12.5	3.4	
Interprovincial Balance	-0.2	-22.8	7.4	2.4	
International exports	32.1	18.9	43.5	18.0	
- International imports	31.9	10.6	41.5	13.1	
International Balance	0.2	-21.0	2.0	-38.4	
Total exports	51.7	10.1	63.4	11.6	
- Total imports	51.8	8.0	54.0	10.2	
Total Trade Balance	0.0		9.4		
A A C . A	DODD. B				

AAG: Average annual growth PGDP: Provincial gross domestic product

Source: Statistics Canada System of National Accounts Division, Input-Output section

# TABLE 3-6 IMPORTANCE OF COMMERCIAL TRANSPORTATION TO CENTRAL CANADA PROVINCES

	(Per cent) QU	10	IT	
	Share PGDP 1996	AAG 91-96	Share PGDP 1996	AAG 91-96
Commercial Transportation	3.5	1.9	2.9	1.6
Air	0.4	1.6	0.4	3.6
Rail	0.9	4.0	0.6	4.3
Water	0.3	5.7	0.1	-6.6
Truck	1.4	3.3	1.1	3.1
Urban transit	0.2	-4.0	0.1	-7.1
Other transport*	0.2	-7.0	0.7	0.9

\* "Other transport" refers primarily to travel agencies and tour operators, taxis, and intercity and charter bus operators.

AAG: Average annual growth PGDP: Provincial gross domestic product

Source: Statistics Canada, Transport Canada estimates

The geography of the Eastern provinces influences the importance of other modes, notably in Newfoundland, where the levels of marine and air transportation are the highest of all provinces and territories – equivalent to British Columbia for marine transportation and to the Territories for air transportation. The other Eastern provinces, however, also have relatively high shares of marine transportation, although growth rates are relatively low or negative.

Table 3-3 shows the relative importance of commercial transportation in each of the provinces in the Eastern region, as well as its percentage of PGDP in 1996 and its average annual growth from 1991 to 1996.

# CENTRAL CANADA

Quebec and Ontario represent the nation's largest provincial economies, with the largest share of manufacturing and construction. They also share the lowest proportions of primary commodity production in Canada. The economies of both provinces exhibit modest growth, with their fastest growing sectors being utilities and trade. Ontario also exhibits growth in manufacturing and construction. Table 3-4 shows the industrial structure of Ouebec and Ontario, their percentages of PGDP and their contribution to annual growth from 1991 to 1996.

With respect to total trade, Quebec exhibited a balanced trade situation, while Ontario showed a trade surplus of 9.4 per cent of its provincial GDP in 1996. The main source of Ontario's trade surplus is interprovincial trade. Its main trade trend is toward increasing international exports, while interprovincial trade remains relatively constant. Table 3-5 shows trade in the Central provinces.

Four factors are contributing to these provinces' relatively low share of for-hire carriers as a percentage of PGDP: their low share of primary commodity production: their relatively higher population density; their relative proximity to large American markets; and their high degree of intermodal freight competition (rail, truck and marine). In Ouebec, for-hire carrier activities are growing at a rate exceeding that of the provincial economy, while in Ontario, their growth is below.

In Central Canada, the most significant mode of transportation is trucking, followed by rail, with both growing at a rate exceeding that of the provincial economies.

Rail has been growing since 1991 at a faster rate than trucking. The relatively higher growth rates for rail indicate the improved competitiveness of railways.

In the sphere of marine transportation, growth in Quebec is related to the increasing attractiveness of the Port of Montreal for container traffic. Ontario is showing a decline in marine transportation.

The main reason for the relatively low growth rates of total for-hire carriers in Central Canada since 1991 is the decline in urban transit and other public passenger modes, such as intercity buses. This decline reflects the ongoing national shift from public passenger transportation to cars. Table 3-6 illustrates the relative

importance of commercial transportation to the Central provinces.

# WESTERN CANADA

A heavy reliance on primary commodity production - particularly in Saskatchewan. Alberta and the Territories characterizes the provinces and territories of Western Canada. Manitoba and British Columbia have relatively higher shares of financial and other services. The provinces of Western Canada exhibit moderate to high growth rates. The main impetus for growth throughout Western Canada is utilities and trade. In Saskatchewan and Alberta, growth is also high in primary commodity production. British Columbia's growth has come from financial and other services. Table 3-7 shows the industrial structure of the Western provinces, as well as their PGDP for 1996 and their annual growth from 1991 to 1996.

Small total-trade deficits characterize international and interprovincial trade in the Western provinces and territories, with the exception of Saskatchewan and Alberta. In 1996, Saskatchewan had a slight trade surplus of 0.3 per cent of PGDP, while Alberta's trade surplus was 12 per cent of PGDP. Interprovincial trade represents a relatively large proportion of trade in Western Canada, with all provinces and territories having interprovincial trade deficits, primarily with Central Canada. As in both Eastern and Central Canada, the primary trend in trade has been growing international

exports, with some growth in interprovincial exports. Table 3-8 shows the impact of trade on the provinces of the Western region.

Western Canada's relatively high level of for-hire carrier transportation activities can be explained by its provinces' reliance on primary commodities production, their lower population density, and their larger distance from markets. However, the provincial locations of the workers and capital employed by the forhire carriers is uneven. This uneven distribution has resulted in a greater proportion of for-hire carrier shares in Manitoba, British Columbia and the Territories. while Alberta's and Saskatchewan's for-hire carrier shares are relatively lower.

Manitoba, ideally located to act as a hub for Western traffic with Central Canada<sup>6</sup>, has the largest for-hire carrier share of any province. British Columbia, ideally located in relation to the Pacific Rim countries, acts as a hub for Canadian traffic with that region of the world. British Columbia's advantage as a hub location, combined with its difficult geography, generates a relatively large share of for-hire carrier transportation.

Both Saskatchewan and Alberta<sup>7</sup> have relatively small for-hire shares, due to the concentration of transportation industry workers and capital in Manitoba and British Columbia.

The Territories exhibit a larger share of for-hire carrier transportation than all other provinces, due to their dispersed

<sup>6</sup> An additional possible reason for Manitoba acting as central staging area is the relative differences in tax rates among the Western provinces, notably between Saskatchewan and Manitoba.

<sup>7</sup> The for-hire carrier share of the provincial economies in Alberta principally, but also Saskatchewan, will considerably underestimate the importance of transport to these provinces as the principal and most valuable primary commodities produced (oil and natural gas) are generally transported by pipeline. In this report, pipelines were not included with transport.

# TABLE 3-7 STRUCTURE OF REGIONAL ECONOMIES **WESTERN CANADA PROVINCES AND TERRITORIES**

	MAN		(Per	cent) SK	AL		ВС		TERR	
	Share 1996	AAG 91-96								
PGDP	100.0	2.1	100.0	2.2	100.0	3.6	100.0	2.8	100.0	1.5
Primary commodities	6.7	-0.3	24.5	3.3	24.6	5.8	6.3	1.6	20.7	-0.2
Manufacturing and construction	17.3	1.5	11.6	1.3	15.0	4.3	17.9	1.1	10.5	1.9
Utilities and trade	29.0	4.7	24.0	4.6	21.5	4.2	26.4	4.1	21.3	2.7
Finance and services	52.8	1.4	45.2	0.9	43.5	1.9	56.4	3.2	51.9	1.9
Government services	7.7	-0.8	5.7	-1.6	3.9	-2.5	4.6	0.0	16.6	-1.4
Other finance and services	45.1	1.9	39.5	1.3	39.6	2.4	51.7	3.5	35.2	3.9

AAG: Average annual growth

Source: Statistics Canada, Cat. 15-203-XPB, Provincial Gross Domestic Product by Industry, 1984–96

**TABLE 3-8** TRADE OF WESTERN CANADA PROVINCES AND TERRITORIES

			(Per	cent)							
	MA			SK	AL <sup>*</sup>		BC			TERR	
	Share PGD 1996	91-96	Share PGL 1996	DPAAG 91-96	Share PGD 1996	91-96	Share PGDF 1996	91-96	Share PGDI 1996	91-96	
Interprovincial exports	26.7	4.6	23.7	5.9	25.6	6.2	13.1	5.6	19.3	3.8	
- Interprovincial imports	30.7	3.7	36.0	3.4	27.5	5.2	21.4	3.8	41.4	-0.7	
Interprovincial Balance	-3.9	-1.1	-12.3	-0.1	-1.9	-2.9	-8.3	1.4	-22.1	-3.4	
International exports	28.3	15.5	39.5	18.2	37.2	19.7	29.3	12.8	24.3	3.6	
- International imports	26.3	14.0	26.9	20.2	23.8	14.0	25.5	11.6	15.9	9.3	
International Balance	2.0	67.5	12.6	14.4	13.4	36.5	3.8	24.5	8.4	-2.8	
Total exports	55.0	9.2	63.2	12.4	62.8	12.8	42.4	10.2	43.6	3.7	
- Total imports	56.9	7.5	62.9	8.5	51.3	8.7	47.0	7.5	57.3	1.3	
Total Trade Balance	-1.9		0.3		11.5		-4.6		-13.7		

Average annual growth

PGDP: Provincial gross domestic product

Source: Statistics Canada System of National Accounts Division, Input-Output section

TABLE 3-9 IMPORTANCE OF COMMERCIAL TRANSPORTATION TO WESTERN PROVINCES AND TERRITORIES

	МА	N	(Per	cent) SK	ALT	Α	ВС		TERR	
	Share PGDI 1996	P AAG 91-96	Share PGL 1996	91-96	Share PGDI 1996	P AAG 91-96	Share PGDP 1996	AAG 91-96	Share PGD 1996	P AAG 91-96
Commercial Transportation	6.2	3.3	2.8	2.9	2.8	3.5	5.2	2.9	6.4	0.9
Air	0.6	2.4	0.1	0.8	0.3	2.9	0.8	1.7	0.9	3.0
Rail	3.4	3.2	1.2	3.7	0.8	3.5	1.1	3.7	0.0	0.5
Water	0.0		0.0		0.0		0.6	-1.8	0.0	-20.0
Truck	1.8	7.8	1.4	4.0	1.5	5.4	1.4	5.2	3.4	0.8
Urban transit	0.1	-4.6	0.0	-7.5	0.1	-4.9	0.2	-0.9	0.0	-2.8
Other transport*	0.4	-4.5	0.1	-3.7	0.1	-2.2	1.1	4.3	2.1	1.2

<sup>\* &</sup>quot;Other transport" refers primarily to travel agencies and tour operators, taxis, and intercity and charter bus operators.

AAG: Average annual growth PGDP: Provincial gross domestic product

Source: Statistics Canada, Transport Canada estimates

population and their distance from Southern Canada.

In all Western provinces except Manitoba, trucking is the largest carrier mode, with rail in second place. In Manitoba, rail places first - because the province has the highest share of rail of all provinces - leaving second place for trucking. Trucking is also the most important mode for the Territories, where air transportation fills the secondplace position. In every Western Canadian province, the growth rates since 1991 for trucking exceed rail, yet both modes have grown since 1991 at a rate exceeding the rates observed in each Western provincial economy.

British Columbia and Newfoundland have the highest shares of marine transportation of all provinces, while the Territories and Newfoundland have the highest shares of air transportation.

As cars and other private transportation continues to take market share away from public road passenger modes, all Western provinces exhibit negative growth rates for urban transit. Table 3-9 illustrates the relative importance of commercial transportation in the Western provinces, its percentage of PGDP in 1996 and its annual growth from 1991 to 1996.

# PROVINCIAL TRANSPORTATION EMPLOYMENT

Employment in commercial transportation activities is another indicator of the importance of transportation to provincial economies. Overall, for-hire carrier employment has been growing at a lower rate than total provincial employment over the period 1991 – 1996.

## EASTERN CANADA

Commercial transportation activities provide moderately high levels of employment in Eastern Canada. New Brunswick has the highest proportion of transportation employment in the Eastern provinces and the second-highest total (after Manitoba) of all provinces. In all Eastern provinces, the growth rate of transportation employment has been, since 1991, below the growth rate in total provincial employment, with a negative growth rate in Newfoundland.

In every Eastern province except Newfoundland, trucking is the largest transportation employer. New Brunswick has the highest proportion of trucking employment of any province in Canada. In Newfoundland, air transportation provides the highest proportion of transportationrelated employment, followed by trucking. In Nova Scotia and New Brunswick, the second most important mode is marine transportation. In fact, the provinces of Eastern Canada exhibit the highest proportion of marine employment of all provinces.

The principal growth in employment has been in air transportation, with high growth rates in Newfoundland, Prince Edward Island and New Brunswick. New Brunswick also exhibits high employment growth in trucking.

In each of these provinces, the principal declines in transportation employment have been in rail, urban transit and other transportation. Table 3-10 shows

the importance of employment in commercial transportation in the Eastern provinces.

# CENTRAL CANADA

Quebec and Ontario exhibit relatively low proportions of employment in commercial transportation. In both provinces, the growth rate of transportation employment is below the growth rates for total employment. The principal employer is trucking, followed by urban transit.

Quebec and Ontario have the highest proportion of employment in urban transportation, a reflection of Central Canada's higher population density. Quebec's principal source of transportation employment growth has been marine transportation; Ontario's principal source has been air transportation. In both provinces, the principal declines were in rail, with Ontario also exhibiting declines in other transportation. Table 3-11 illustrates the importance of commercial transportation employment in Quebec and Ontario.

#### WESTERN CANADA

The provinces of Western
Canada exhibit relatively high
proportions of commercial
transportation employment.
Manitoba enjoys the highest level
of all provinces, with British
Columbia and the Territories also
showing high levels, but
Saskatchewan and Alberta are
confined to lower levels. In each
Western province, the growth rate
for employment in commercial
transportation services has been
less than the growth rate of total
employment.

TABLE 3-10
IMPORTANCE OF COMMERCIAL TRANSPORTATION EMPLOYMENT
TO FASTERN CANADA PROVINCES

			NIP.					
	NF Share 1996	AAG 91-96	Share 1996	PEI AAG 91-96	Share 1996	AAG 91-96	Share 1996	AAG 91-96
Total employment	100.0	1.0	100.0	4.1	100.0	2.4	100.0	2.6
Commercial Transportation	3.7	-4.2	4.7	0.0	3.7	0.0	5.5	2.1
Air .	1.2	4.7	0.5	48.9	0.5	1.0	0.2	10.6
Rail	0.4	-9.6	0.0		0.2	-10.2	0.5	-9.3
Marine	0.7	-3.8	1.0	0.5	0.6	-0.4	0.6	8.0
Truck	0.9	-5.9	1.6	3.3	1.8	6.3	3.6	9.2
Urban transit	0.1	-8.3	0.0		0.2	-8.0	0.1	-7.4
Other transport	0.4	-9.0	1.5	-6.6	0.3	-6.3	0.5	-9.1

AAG: Average annual growth

Source: Statistics Canada, Transport Canada estimates

TABLE 3-11
IMPORTANCE OF COMMERCIAL TRANSPORTATION EMPLOYMENT
TO CENTRAL PROVINCES

	(Per cent)					
	QU Share PGDF 1996		ONT Share PGDP AAG 1996 91-96			
Total employment	100.0	3.0	100.0	2.3		
<b>Commercial Transportation</b>	4.1	1.8	3.4	1.1		
Air	0.5	3.8	0.5	14.2		
Rail	0.4	-9.8	0.3	-2.5		
Marine	0.4	11.4	0.1	1.0		
Truck	1.2	2.1	1.1	5.0		
Urban transit	0.9	-0.6	0.8	1.6		
Other transport	0.6	19.2	0.6	-7.5		
AAG: Average applied growth PCDD:	Provincial group domi		-4			

AAG: Average annual growth PGDP: Provincial gross domestic product Source: Statistics Canada, Transport Canada estimates

Rail is the largest employer among the transportation modes in Manitoba, where rail employment is of higher relative importance than in any other province. In Saskatchewan and Alberta, trucking is the largest employer, while other transportation is the largest employer in British Columbia and the Territories.

In Manitoba, British Columbia and the Territories, the second largest employer is trucking, while in Saskatchewan, second place goes to rail. Alberta benefits from equal employment levels of air transportation, rail and urban transit. Manitoba and the Territories – along with Newfoundland – have the highest proportion of air of all provinces in Canada.

In every Western province, the air and trucking modes exhibit the highest employment growth. Declining employment is observed in rail and urban transit. Table 3-12 illustrates the importance of employment in commercial transportation in Western Canada.

TABLE 3-12
IMPORTANCE OF COMMERCIAL TRANSPORTATION EMPLOYMENT
TO WESTERN PROVINCES AND TERRITORIES

			(Per	Cent)						
		AN				ALTA		BC		RR
	Share 1996	AAG 91-96								
Total employment	100.0	3.1	100.0	2.8	100.0	4.0	100.0	4.2	100.0	6.7
Commercial Transportation	5.8	1.1	4.0	2.1	4.3	1.7	4.8	2.4	5.3	0.0
Air	1.0	13.9	0.4	9.3	0.6	8.5	0.9	6.3	0.9	4.0
Rail	1.9	-4.2	1.0	-3.8	0.6	-5.6	0.4	-4.8	0.0	-11.2
Marine	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.6	0.0	0.0
Truck	1.8	12.4	2.1	8.8	2.3	7.5	1.0	7.2	2.1	-1.3
Urban transit	0.4	-4.7	0.2	-7.1	0.6	-5.7	0.6	-4.0	0.1	-7.2
Other transport	0.6	-5.8	0.4	-4.9	0.2	-4.6	1.3	3.8	2.2	0.3

AAG: Average annual growth

Source: Statistics Canada, Transport Canada estimates

# TOTAL TRANSPORTATION DEMAND

The first two sections of this chapter examined two indicators of the supply side of commercial transportation services to provincial economies: value-added and employment. This section looks at the demand for total transportation.

"Total transportation" refers to a broader definition of transportation, because it also includes private spending on transportation,<sup>8</sup> such as consumer purchases of cars, and government expenditures,<sup>9</sup> such as highway maintenance and construction, as well as sales of commercial transportation services.<sup>10</sup>

"Total transportation demand" "refers to transportation purchases

by consumers, businesses and governments within a province. Total transportation demand can be compared to provincial final domestic demand (PFDD), defined as the total value of all goods and services sold in the provincial economy in one year.

The principal observation that emerges from assessing total transportation demand is the predominance of private transportation, which is the largest segment of total transportation demand in all provinces, although not in the Territories.

The principal component of private transportation demand is retail vehicle dealer sales through, for example, car dealerships. In every province, retail vehicle dealer sales are larger than any single modal commercial transportation activity.

In general, the demand for commercial transportation is the second largest segment of transportation demand, everywhere but in Prince Edward Island and the Territories. There are two principal differences between the provincial assessment of the for-hire carriers based on value-added (production) and the assessment based on demand. The first difference is the relatively greater importance of the air and marine modes: the second is the relative shift in the importance of provincial for-hire carrier transportation within Eastern and Western Canada.

When measuring the importance of transportation to regional economies from transportation demand, the relative greater importance of the air and marine modes is measured in relation to their importance under one of the other indicators – in this case,

8 Private transport spending refers to sales to consumers, businesses and government. It includes sales and services tied to automotive vehicles, parts and accessories; and automobile and truck rental and leasing services.

9 Government expenditures are estimated net of direct fees for services. Direct fees are distinguished from indirect fees, such as fuel excise taxes, which form part of general government revenues.

10 The definition of commercial transportation differs from that used in the section on value-added, which excluded travel agencies, tour operators, charter bus operators, freight forwarders and smaller carriers in air, trucking and marine.

11 Total transportation demand is a mixture of the intermediate and final demand goods and services, and should not be confused with the standard macro-economic concept of final demand. As the term refers to a mixture of intermediate- and final-demand goods and services, it contains some double-counting, and thus overestimates somewhat the importance of transport demand as a proportion of final domestic demand.

**TABLE 3-13** IMPORTANCE OF TOTAL TRANSPORTATION DEMAND TO EASTERN PROVINCES

			r cent)		Ne		All	
	NFL Share PFDD		Share PFDD		NS Share PFDD		Share PFDD	
	1996	91-96	1996	91-96	1996	91-96	1996	91-96
Final transportation demand	100.0	1.5	100.0	2.1	100.0	1.2	100.0	2.1
Domestic transport demand	15.7	1.6	20.0	4.6	16.7	2.0	20.2	3.2
Commercial transportation services	4.6	6.2	3.2	5.0	5.1	3.4	5.2	4.7
Air	2.3	6.7	0.8	-1.4	1.1	-1.5	0.7	1.5
Rail	0.1	-14.8	0.1	-13.7	0.7	-7.2	0.8	0.4
Marine	0.7	9.6	0.1	9.0		10.9	1.1	11.0
Truck	1.2	6.8	2.0	8.8	1.7	5.7	2.3	4.6
Urban transit	0.0	0.0	0.0	0.0	0.1	0.2	0.0	-0.6
Other	0.2	-0.2	0.2	0.5	0.3	0.3	0.2	0.0
Private transportation sales	9.1	0.4	12.5	7.2	9.1	2.0	11.3	3.6
Retail vehicle dealers (new and used)	5.2	3.6	6.1	5.4	5.1	4.8	7.3	5.2
Gasoline service stations	2.4	-6.5	4.4	10.6	2.5	-3.4	1.8	-3.0
Retail vehicle parts and repair shops	1.4	0.2	1.7	5.1	1.3	2.1	1.9	3.6
Vehicle rental agencies	0.2	1.6	0.2	4.8	0.2	-0.3	0.2	2.5
Government expenditures	1.9	-4.1	4.3	-3.2	2.5	-0.7	3.7	-0.3
Road construction and maintenance	1.2	-6.0	4.2	-3.2	2.3	-0.7	3.4	-0.5
Urban transit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other subsidies and administration	0.7	-0.7	0.1	0.0	0.1	-1.1	0.3	2.3
Total indirect fees	1.6	-4.5	2.8	9.9	1.7	-1.8	1.5	-0.4
Fuel taxes	1.3	-6.5	2.4	10.6	1.4	-3.4	1.0	-3.0
Licence fees	0.3	3.6	0.4	5.4	0.3	4.8	0.5	5.2
Government expenditures less indirect fees	s 0.3	-1.5	1.5	-28.3	0.8	1.5	2.3	-0.1

PFDD: Provincial final domestic demand AAG: Average annual growth

Source: Statistics Canada, Transport Canada estimates

Canada's international trade deficits in these two modes.

A trade deficit implies a proportion of domestic demand satisfied by foreign carriers.<sup>12</sup> In terms of marine demand, the relatively higher importance is particularly noticeable in the provincial economies of Nova Scotia, New Brunswick, Quebec and British Columbia. The increasing importance of air transportation is more widespread, but particularly noticeable in Ontario, Quebec, Manitoba and British Columbia.

In general, government expenditure is the third most important segment of transportation demand, except in the Territories and Prince Edward Island, where it ranks first and second, respectively. Government expenditures on transportation are predominantly in road construction and maintenance. The trend in all provinces but Manitoba has been toward lower levels of government spending on transportation.

"Indirect fees on transportation" refers to government revenues earmarked for general taxation funds, of which the most significant tax funds are fuel excise taxes. While the level of indirect fees has remained relatively constant, governmental transportation expenditures have declined in all provinces. The level of government expenditures, net of indirect fees, has declined in all provinces as well. In 1996, Alberta and Saskatchewan had expenditures on transportation equivalent to the revenue of the indirect fees they collected from the sector in that year.

# EASTERN CANADA

The provinces of Eastern Canada exhibit varying levels of total transportation demand, ranging from the lowest in Newfoundland to relatively high levels in New Brunswick and Prince Edward Island. The variations are directly related to private transportation sales and government transportation expenditures, which are low in Newfoundland and higher in Prince Edward Island and New Brunswick. In all Eastern provinces, the growth rate for total transportation demand exceeds the growth rate of PFDD.

The largest segment of total transportation demand is private transportation sales, of which the largest component is tied to retail vehicle dealers. The growth rates of private transportation sales exceed those for total transportation demand in Prince Edward Island and New Brunswick, are equal to those in Nova Scotia, and represent less than the growth rate of total transportation demand in Newfoundland.

In all Eastern provinces, commercial transportation services represent the second largest segment of total transportation demand. The growth rate of commercial transportation demand exceeds that of total transportation demand in all provinces.

Trucking represents the largest component of commercial transportation demand in all Eastern provinces except Newfoundland, where it is the second largest. Air transportation is the largest component in Newfoundland and the second

largest in Prince Edward Island. In Nova Scotia and New Brunswick, marine transportation represents the second largest component. In all provinces, marine is the fastest growing component, followed by trucking. Declines are observed in rail in all provinces but New Brunswick.

In all Eastern provinces, government expenditures form the smallest segment of total transportation demand.
Government expenditures are the second largest segment in Prince Edward Island, which exhibits the highest proportion of government expenditures on transportation of any province, due to the construction (during the period covered by this report) of the Confederation Bridge linking the province to the mainland.

In all Eastern provinces, road construction and maintenance forms the major component of government expenditures, although both total government expenditures on road construction and maintenance are declining in all provinces.

In every Eastern province, indirect fees on transportation are composed primarily of fuel excise taxes. Indirect fees on transportation are also declining in all provinces, but Prince Edward Island. In the larger provinces indirect fees have declined at a faster rate than government expenditures, generating increasing levels of government expenditures on transportation, net of indirect fees.

Table 3-13 shows the importance of total transportation demand in each of the provinces in the Eastern region.

<sup>12</sup> It is important to distinguish between the concepts of domestic demand used for purposes of transport regulation, and that used in macro-economic accounting. For purposes of regulation, "domestic demand" refers to transport between two points within Canada. In macro-economic terms, it refers to purchases of transport by domestic consumers, businesses and governments.

# TABLE 3-14 IMPORTANCE OF TOTAL TRANSPORTATION DEMAND TO THE CENTRAL PROVINCES

(Per d	(Per cent)								
	Share PFI 1996	DD AAG 91-96	Share PFD 1996	NT DD AAG 91-96					
Final domestic demand	100.0	1.6	100.0	1.7					
Total transportation demand	17.1	3.3	16.1	3.9					
Commercial transportation services Air Rail Water Truck Urban transit Other	3.7 1.0 0.4 0.6 1.3 0.2 0.3	3.4 0.5 0.1 8.3 5.6 -1.0 0.4	3.6 1.2 0.4 0.2 1.3 0.2 0.3	0.7					
Private transportation sales Retail vehicle dealers (new and used) Gasoline service stations Retail vehicle parts and repair shops Vehicle rental agencies	11.3 7.1 2.1 1.8 0.3	4.0 5.3 1.5 3.0 -3.5	10.6 6.6 2.1 1.5 0.4						
Government expenditures Road construction and maintenance Urban transit Other subsidies and administration	2.1 1.3 0.4 0.4	-0.7 1.6 0.0 -0.4	1.8 1.3 0.4 0.1	-1.8 -1.7 0.0 -12.9					
Total indirect fees Fuel taxes Licence fees  Government expenditures less indirect fee	1.6 1.1 0.4 s 0.5	2.6 1.5 5.3	1.6 1.1 0.4	<b>4.7</b> 4.2 6.3					
GOVERNMENT EXPENDITURES 1633 MUNICULIES	3 0.0	-1110	0.2	40.2					

PFDD: Provincial final domestic demand

AAG: Average annual growth

Source: Statistics Canada, Transport Canada estimates

# CENTRAL CANADA

Quebec and Ontario have moderate levels of total transportation demand, primarily due to relatively low levels of commercial transportation demand. In both provinces, the growth rates of total transportation demand exceed that of PFDD.

The largest segment of total transportation demand in each province is private-transportation sales. The largest component of private-transportation sales is tied to retail vehicle sales. The growth rates of private-transportation sales exceed those for total

transportation demand in both provinces, with private transportation sales the fastest growing segment of total transportation demand and retail vehicle sales the fastest growing component of private-vehicle sales.

In both provinces, commercial transportation represents the second largest segment of total transportation demand, but at relatively lower levels when compared with most Eastern and Western Canadian provinces. The growth rates of commercial transportation activities exceeds the growth rates of PFDD in both

provinces. The growth rate of the for-hire carriers slightly exceeds the growth rate of total transportation demand in Quebec, and are less than total transportation demand growth in Ontario.

In both provinces, trucking is the principal mode, followed by air. The most significant growth is observed for marine, followed by trucking, with declines in urban transit in both provinces, and in rail for Ontario.

In both provinces again, government expenditures form the smallest segment of total transportation demand, with road construction and maintenance forming the major segment of government transportation expenditures. Total government transportation expenditures are also declining, while expenditures on road construction and maintenance are increasing in Quebec and declining in Ontario.

In both Quebec and Ontario, indirect fees on transportation are composed primarily of fuel excise taxes. Indirect fees have been increasing in both provinces, generating a falling level of net government expenditures on transportation.

Table 3-14 illustrates the importance of total transportation demand in Quebec and Ontario.

## WESTERN CANADA

Provinces in Western Canada exhibit different levels of total transportation demand. British Columbia shows the highest level of all provinces. Throughout this region, the growth rate for total transportation demand exceeds the growth rate of PFDD. In British Columbia, the two rates are roughly equivalent. The

**TABLE 3-15** IMPORTANCE OF TOTAL TRANSPORTATION DEMAND TO WESTERN PROVINCES AND TERRITORIES

			(Per	cent)						
		AN	SA		AL		В	_		RR
	Share PFD 1996	91-96	Share PFD 1996	91-96	Share PFD 1996	D AAG 91-96	Share PFDL 1996	91-96	Share PFD 1996	D AAG 91-9
inal domestic demand	100.0	2.5	100.0	2.7	100.0	2.8	100.0	3.7	100.0	3.2
Domestic transportation demand	17.4	4.1	18.9	4.4	18.3	4.4	20.1	3.6	21.4	3.6
Commercial transportation servi	ices 5.1	4.6	5.4	2.9	5.9	6.4	7.3	5.1	8.6	4.5
Air	1.6	6.3	0.7	-5.1	1.7	6.0	1.5	4.6	6.4	5.0
Rail	1.0	-1.9	2.5	0.5	1.4	2.2	2.1	1.5	0.1	-10.9
Water	0.0	11.9	0.0	0.0	0.0	0.0	1.7	8.7	0.0	18.2
Truck	2.1	7.2	2.0	9.0	2.5	9.9	1.6	7.2	2.0	3.5
Urban transit	0.1	-1.9	0.0	-6.8	0.1	-2.3	0.2	2.4	0.0	0.0
Other	0.2	0.0	0.1	-0.6	0.2	0.6	0.3	2.4	0.0	0.0
Private transportation sales	10.6	5.0	11.6	6.0	10.8	4.6	10.7	4.3	4.4	5.
Retail vehicle dealers (new and u	used) 6.5	6.3	7.4	7.0	7.0	6.0	7.0	4.8	2.7	5.
Gasoline service stations	2.4	1.5	2.5	5.2	2.0	2.8	2.0	2.6	0.8	2.
Retail vehicle parts and repair sh	ops 1.5	4.9	1.6	3.1	1.5	1.4	1.4	4.6	0.6	2.
Vehicle rental agencies	0.2	2.4	0.1	4.5	0.3	1.3	0.3	2.6	0.3	10.
Government expenditures	1.7	-3.0	1.9	-1.8	1.7	-4.3	2.1	-5.8	8.4	1.
Road construction and maintena	nce 1.4	-3.4	1.8	-1.9	1.4	-4.6	1.5	-6.8	5.0	3.
Urban transit	0.1	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.
Other subsidies and administration	on 0.2	-0.5	0.1	0.0	0.3	-3.4	0.1	-14.6	3.4	-0.
Total indirect fees	1.7	2.7	1.8	5.6	1.5	3.7	1.6	3.2	0.6	3.
Fuel taxes	1.3	1.5	1.4	5.2	1.1	2.8	1.1	2.6	0.5	2.0
Licence fees	0.4	6.3	0.5	7.0	0.4	6.0	0.4	4.8	0.2	5.8
overnment expenditures less indirect f	ees 0.0		0.0		0.2	-69.4	0.5	-33.2	7.8	1.8

geographic characteristics of British Columbia and the Territories determine their relatively high shares of transportation demand.

The largest segment of total transportation demand in all Western provinces is private transportation sales. They contribute to the second largest segment in the Territories. The largest component of privatetransportation sales is retail vehicle dealer sales, in all provinces and the Territories. The growth rate of

private transportation sales exceeds that of total transportation demand.

In every Western province, commercial transportation represents the second largest segment of total transportation demand, but it represents the smallest segment in the Territories. The growth rate of commercial transportation demand exceeds that of total transportation demand in all provinces and the Territories, except Saskatchewan.

Trucking represents the largest segment of commercial

transportation demand in Manitoba and Alberta, and the second largest in Saskatchewan and the Territories. Rail is the most important in Saskatchewan and British Columbia, and second in importance in Alberta. Air transportation is the largest segment in the Territories and the second largest in Manitoba. Marine is the second largest segment in British Columbia.

The most significant 13 growth in trucking occurred in Manitoba, Saskatchewan and Alberta, while

<sup>13</sup> Significant growth refers to growth in transport demand that forms a major segment of provincial demand. For example, there is a small port in Churchill, Manitoba, which has high growth. Marine transport, however, does not constitute a significant portion of transport demand in Manitoba.

# TABLE 3-16 IMPORTANCE OF TOTAL TRANSPORTATION INVESTMENT TO THE EASTERN PROVINCES

(Per cent share of the 1992 - 1995 Annual Average Investment)

	NFLD	PEI	NS	NB
Total Transportation	15.2	39.6	27.1	26.3
Equipment	8.3	10.1	16.3	9.6
Infrastructure	6.9	29.4	10.8	16.6
Road	11.6	35.8	20.9	24.3
Equipment (e.g. cars, trucks)	5.7	8.6	12.3	8.6
Roads and bridges	5.9	27.2	8.5	15.7
Rail	0.0	0.0	.0.4	0.5
Equipment (e.g. locomotives)	0.0	0.0	0.2	0.2
Rail track and roadbeds	0.0	0.0	0.2	0.3
Marine	2.3	2.8	4.4	1.0
Equipment (e.g. ships)	1.2	0.6	2.3	0.5
Marine engineering construction	1.0	2.2	2.0	0.5
Air	1.4	0.9	1.5	0.5
Equipment (e.g. aircraft)	1.4	0.9	1.5	0.4
Runways including lighting	0.0	0.0	0.0	0.1
Source: Statistics Canada Cat 61-223 "Capital Evi	anditurae hy	Time of Accet"		

growth in marine is highest in British Columbia, and growth in air transportation highest in the Territories. Air transportation also showed notable growth in Manitoba.

Notable declines were registered in urban transit in Manitoba, Saskatchewan and Alberta, in rail in Manitoba, and in air transportation in Saskatchewan.

In all Western provinces, government expenditures form the smallest segment of total transportation demand, although it is the second largest segment in the Territories. In all Western provinces, road construction and maintenance forms the largest component of government expenditures, while in the Territories, the largest component goes to subsidies and administration. In each Western province but Manitoba and the Territories, total government expenditures are declining. Expenditures on roads are

decreasing in Saskatchewan and Alberta and increasing in the two other Western provinces and in the Territories.

In every Western province and in the Territories, indirect fees on transportation are increasing. This increase generates a falling level of government expenditures on transportation net of indirect fees in all provinces.

Table 3-15 shows the importance of total transportation demand in the Western provinces.

# PROVINCIAL TRANSPORTATION INVESTMENT

Whether the investment is made by business or government, "transportation investment" can be defined as both new infrastructure construction, and purchases of new machinery and equipment. Transportation investment does not include repair and maintenance expenditures, which are expenditures on existing infrastructure, machinery and equipment.

A distinction is introduced here between investment in infrastructure such as roads, and in equipment. Transportation infrastructure investment is broken down into four categories: road, rail, marine and air.

Transportation investments are usually major expenditures and take place over a number of years. To account for this fact, investment is analysed using a four-year average of the four most recent years with investment information available, i.e., 1992 – 1995. Investment in transportation is then compared with total investment in provincial economies, excluding residential construction.

The principal observation derived from assessing investment in transportation is that in all provinces there is a predominance of road transportation investment, in terms of both road infrastructure and equipment. The question of transportation infrastructure investment is controversial. Some economists have suggested that public infrastructure investment, such as in roads, increases growth in the economy by more than the amount of the investment, due to spin-off benefits to the other sectors of the economy. Other economists argue the contrary - that economic growth generates the need for public infrastructure investment, with limited spin-off benefits. While both sides talk of a relationship between public infrastructure investment and economic growth, the debate centres on the question of causality, nature, and the importance of the relationship.

# EASTERN CANADA

In Eastern Canada, transportation investments represented more than a quarter of all investments for three of the four provinces. In Newfoundland, the share of transportation investment was the lowest, at 15.2 per cent. Over the period, road investment predominated in all provinces. Prince Edward Island exhibited the highest level of investment, due to the construction of the Confederation Bridge.

The second most important mode in all Eastern provinces is marine. Nova Scotia has the highest proportion of marine investment of all provinces.

Table 3-16 shows the importance of total transportation investment in the Eastern provinces on average from 1992 to 1995.

# CENTRAL CANADA

Transportation investment in Ouebec and Ontario between 1992 and 1995 has averaged roughly one fifth of total investment. However in both Quebec and Ontario, transportation investments have been predominantly road-related investment, two thirds on the equipment side and one third on roads. The second highest level of transportation investment was observed in air, primarily in air transportation equipment. For Ontario, rail investments were as important as air, with relatively equal levels of investment in rail equipment and infrastructure.

Quebec's somewhat lower share of transportation investment reflects the lower growth rates of the Quebec economy relative to Ontario, which translated into relatively lower investment in road equipment.

# TABLE 3-17 IMPORTANCE OF TOTAL TRANSPORTATION INVESTMENT TO THE CENTRAL PROVINCES

(Per cent share of the 1992 – 1995 Annual Average Investment)

	QUE	ONT
Total Transportation	17.9	21.0
Equipment	11.4	14.7
Infrastructure	6.5	6.3
Road	16.2	18.8
Equipment (e.g. cars, trucks)	10.3	13.4
Roads and bridges	5.9	5.4
Rail	0.6	0.9
Equipment (e.g. locomotives)	0.4	0.4
Rail track and roadbeds	0.2	0.5
Marine	0.5	0.5
Equipment (e.g. ships)	0.1	0.1
Marine engineering construction	0.4	0.4
Air	0.7	0.9
Equipment (e.g. aircraft)	0.6	0.8
Runways including lighting	0.0	0.0

Source: Statistics Canada, Cat. 61-223 "Capital Expenditures by Type of Asset"

# TABLE 3-18 IMPORTANCE OF TOTAL TRANSPORTATION INVESTMENT TO THE WESTERN PROVINCES AND TERRITORIES

(Per cent share of the 1992 - 1995 Annual Average Investment)

	MAN	SASK	ALTA	BC	TERR
Total Transportation	19.2	13.0	12.7	21.4	14.0
Equipment Infrastructure	12.1 7.1	9.0 4.0	8.6 4.0	12.6 8.8	6.3 7.7
	16.9	11.4	11.4	17.3	8.0
Road Equipment (e.g. cars, trucks) Roads and bridges	10.9	8.1 3.4	7.9 3.5	10.3 7.0	3.9 4.1
Rail	1.0	0.9	0.6	1.6	0.0
Equipment (e.g. locomotives) Rail track and roadbeds	0.4 0.6	0.4 0.5	0.2 0.3	0.8 0.8	0.0
Marine	0.4	0.1	0.2	1.5	0.8
Equipment (e.g. ships)  Marine engineering construction	0.1 0.3	0.0 0.1	0.0 0.2	0.8 0.7	0.6 0.3
Air	0.9	0.5	0.5	0.9	5.2
Equipment (e.g. aircraft)	0.8	0.5	0.5	0.7	1.9
Runways including lighting	0.1	0.0	0.0	0.2	3.3

Source: Statistics Canada, Cat. 61-223 "Capital Expenditures by Type of Asset"

Table 3-17 illustrates the importance of total transportation investment in Quebec and Ontario on average from 1992 to 1995.

## WESTERN CANADA

Between 1992 and 1995, Saskatchewan and Alberta had the lowest share of transportation investment. For the other Western provinces, transportation investments accounted for one fifth of total provincial investments.

Road investment predominates in all Western provinces and the Territories, primarily investment in road transportation equipment in the Western provinces and investment on road infrastructure in the Territories.

Rail has the second highest level of investment in the Western provinces, as opposed to air for the Territories. British Columbia has the highest proportional investment in rail of all provinces, equally split between equipment and infrastructure. The Territories has the highest proportion of air investment, primarily air infrastructure.

Table 3-18 charts the importance of total transportation investment in the Western provinces on average from 1992 to 1995.

# GOVERNMENT SPENDING ON TRANSPORTATION

With the overall reduction in subsidization and infrastructure commercialization initiatives, total government spending on transportation came down.

This chapter describes expenditures on and revenues from transportation by all three levels of government – federal, provincial/ territorial and municipal. It discusses subsidies to transportation by mode, as well as the provision of facilities and services that are provided at public expense. In addition, the chapter looks at the services provided by transportation operators for imposed public duties. The figures presented are for standard Canadian government fiscal years, from April 1 to March 31, unless otherwise indicated.

Traditionally, government's involvement in transportation essentially fell into three functions: regulation (economic and safety), provision of infrastructure, and subsidization and production of transportation services. Over the last few years, government's role in transportation has been redefined and the economic regulatory framework has been lessened, paving the way for a significantly greater role for market forces.

GOVERNMENT
TRANSPORTATION
EXPENDITURES AND
REVENUES

# EXPENDITURES BY LEVEL OF GOVERNMENT

This section covers spending on transportation by all levels of government and their agencies, including operating costs, such as salaries, capital expenditures and grants, as well as contributions and payments to corporations. Where possible, gross spending on the sector and revenues obtained from it are shown separately.

# TABLE 4-1 GOVERNMENTS' NET EXPENDITURES ON TRANSPORTATION

(Millions of dollars)								
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97		
Federal	3,633	3,109	3,200	3,025	3,295	2,705		
Provincial/Territorial	7,871	7,437	7,230	7,558	7,603	7,169		
Municipal*	5,650	5,862	5,941	6,007	6,173	6,079		
Total	16,954	16,408	16,371	16,590	17,071	15,953		

\* Calendar basis

Source: Main Estimates of Government of Canada; Transport Canada, Finance Directorate; Canadian Transportation Agency; Internal reports from several agencies and federal departments; Provincial and Territorial Departments of Transportation; Statistics Canada, Public Institutions Division, Unpublished data.

# TABLE 4-2 GOVERNMENTS' REVENUES FROM TRANSPORTATION NOT CREDITED TO TRANSPORTATION BUDGETS

1101 011	has been a fine her a v	J IIIAIIC	/ OIIIAI	1011 000	- CT III - C				
(Millions of dollars)									
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97			
Federal fuel taxes	3,150	3,218	3,302	3,415	3,873	4,023			
Provincial/Territorial									
Fuel taxes	4,390	4,988	5,183	5,426	5,526	5,638			
Licence fees	2,256	2,337	2,493	2,568	2,513	2,690			
Total	9,796	10,543	10,978	11,409	11,912	12,351			
Source: Transport Canada	Provincial and 1	Forritorial Dan	artmente of Ti	ranenartation					

Most government revenues derived from a transportation activity or use of a facility or service are not specifically earmarked for expenditures in that sector. Instead, they are deposited into the government Consolidated Revenue Fund. Federal and provincial/territorial revenues raised from taxes on fuels, for instance, are considered an important source of general government revenue — they are not allocated to the transportation sector.

Some other transportation revenues, however, such as those derived from federally operated airports, are credited to Transport Canada's budget. Until recently, the air transportation tax or ATT paid on airline tickets was credited to Transport Canada's budget. This procedure, known as "vote-netting,"

is used mainly by the federal government. Parliament approves a voted amount of money (net expenditures) to which vote netted revenues are deleted to provide the total funds (gross expenditures) available for a program. Since 1996/97, the ATT has been credited to the Consolidated Revenue Fund and Parliament has increased the voted (or "net") expenditures by an equivalent amount.

For all levels of government, net expenditures on transportation dropped to just over \$15 billion in 1996/97, with the federal government accounting for 18 per cent and the provincial/territorial and municipal governments for 41 per cent each. Table 4-1 shows the net transportation expenditures by level of government.

## Non-Credited Government Revenues

Government revenues collected from transport users that were not directed to the transportation budget grew at an average rate of 4.7 per cent over the past five years to reach \$12.4 billion in 1996/97. These revenues come mainly from motor vehicle use: permit and licence fees collected by the provincial and territorial governments, and fuel taxes collected independently by both the provinces/territories and the federal government.

Fuel taxes make up close to 80 per cent of the total of non-credited taxes in 1996/97. Over the years, this percentage has increased as licence fee revenues have grown at an average annual rate of just under three per cent, while fuel tax revenues have risen an average of five per cent. Table 4-2 shows the non-credited government revenues from transport from 1991/92 to 1996/97.

In the case of provincial fuel taxes, an adjustment has been made to deduct an amount equal to that of the provincial sales taxes where sales tax is not levied on fuel. This adjustment is based on the assumption that some fuel taxes replace provincial sales taxes. The intention here is to identify only those taxes specific to transport use. Approximately \$600 million is deducted per year.

1.9

# FEDERAL EXPENDITURES AND REVENUES ON Transportation

# GROSS FEDERAL **EXPENDITURES**

Expenditures on transportation by the federal government include the entire budgets of Transport Canada, the Canadian Transportation Agency, the Transportation Safety Board of Canada and the Civil Aviation Tribunal of Canada, as well as certain expenditures by other federal departments. Spending includes operational and capital expenditures, subsidies, and grants and contributions to Crown corporations and other "transportation" entities.

Actual gross spending (not accounting for revenues credited to the budget) by the federal government on transportation during fiscal year 1996/97 reached \$3.3 billion, after peaking at \$4.7 billion in 1991/92. Spending in 1997/98 is expected to drop to \$3.1 billion. Table 4-3 shows federal government spending on transportation from 1991/92 to 1997/98.

Transport Canada's gross expenditures on transportation accounted for about 76 per cent of total federal spending on transportation in 1996/97. The department has shifted its focus from being an operator and subsidizer to concentrating on the core areas of developing policy and legislation, and enforcing safety and security standards.

To put federal spending on transportation into perspective, in 1981/82, those expenditures

## TABLE 4-3 FEDERAL GOVERNMENT GROSS EXPENDITURES **ON TRANSPORTATION**

		(Million	s of dolla	ars)			
	1991/92	1992/93	1993/94	1994/951	1995/962	1996/97	1997/98³
Transport Canada	3,202	2,984	3,096	2,977	3,448	2,501	2,422
Other <sup>4</sup>	1,479	1,108	1,033	1,050	1,046	791	679
Total	4,681	4,092	4,129	4,027	4,494	3,292	3,101
T	111						

Total transport expenditures as per cent of total federal expenditures

2.5

1	Transport Canada expenditures include a budgetary expenditure of \$1,101 million for the lowering of the
	value of the assets on the Accounts of Canada relating to the sale of the Canadian National Railways.
2	Starting in that fiscal year, Canadian Coast Guard operations related to transportation included under

2.4

2.4

2.8

2.0

2.9

Source: Main Estimates of the Government of Canada; Transport Canada - Finance; Canadian Transportation Agency; internal reports from several agencies and departments

## TABLE 4-4 TRANSPORT CANADA'S **GROSS SPENDING ON TRANSPORTATION**

(Millions of dollars)							
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/981
Operating and EBP <sup>2</sup>	1,756	1,686	1,677	1,687	2,320	1,155	519
Capital	533	499	588	501	297	273	106
Grants & Contributions 3	913	799	831	789	831	1,073	1,797
Total	3,202	2,984	3,096	2,977	3,448	2,501	2,422

1 Forecast as at January 31, 1998 of full fiscal year actual expenditures.

 2 EBP is Employee Benefit Plan
 3 Includes transfers to Crown corporations as well as \$348 million in 1997–98 to Newfoundland for termination of ferry services

Source: Transport Canada - Finance

represented 4.4 per cent of total federal spending. In 1996/97, that ratio dropped to two per cent and even further decreases are expected in 1997/98.

# TRANSPORT CANADA EXPENDITURES

As more and more departmental operations were transferred to other entities, Transport Canada's budget was reduced accordingly. Operating expenditures amounted to almost \$1.8 billion in 1991/92, accounting for as much as 55 per cent of the entire budget. This declined to slightly more than half a billion in 1997/98, representing less than

25 per cent of the total Transport Canada budget. Table 4-4 shows Transport Canada's gross spending on transportation.

# TRANSPORT CANADA REVENUES BY MODE

Transport Canada raises revenues through airport fees and leases, and port and harbour fees, which are credited to the departmental budget. These cost recoveries amounted to \$587 million in 1996/97 after peaking at almost \$1.2 billion in 1995/96, when the air transportation tax was still credited to the departmental budget.

<sup>3</sup> Forecast as at January 31, 1998 of full fiscal year actual expenditures.
4 Includes the Canadian Transportation Agency, the Transportation Safety Board, the Aviation Safety Board the Civil Aviation Tribunal as well as transportation expenditures by other federal departments such as DFO, PWC and Parks Canada

# TABLE 4-5 REVENUES CREDITED TO TRANSPORT CANADA'S BUDGET

(Millions of dollars)							
	91/92	92/93	93/94	94/95	95/96	96/971	97/98 <sup>2</sup>
Air transportation tax	485.9	498.1	530.0	588.8	682.7	-	-
Airport fees/leases	479.1	379.4	291.3	303.3	367.9	324.6	156.5
Air navigation fees <sup>3</sup>	32.4	37.4	45.1	38.5	70.8	179.7	-
Ports and harbours fees	8.6	28.4	27.4	23.3	21.0	25.7	16.7
Other fees and recoveries 4	41.8	39.9	35.2	48.4	56.1	57.4	51.2
Total	1,047.8	983.2	929.0	1,002.3	1,198.5	587.4	224.4
							100

Total as a per cent of gross federal transport expenditures 22.4 24.0 22.5 24.9 26.7 17.8 7.2

- 2 Forecast as at January 31, 1998 of full fiscal year actual expenditures.
- 3 Air navigation systems was privatized as Nav Canada on November 1, 1996.
- 4 Includes inter- and intra-departmental transfers for services and various regulatory, licensing and administrative fees.

Source: Main Estimates, Government of Canada, Part III; Transport Canada, Finance Directorate

# TABLE 4-6 TRANSPORT CANADA LEVEL OF COST RECOVERY

(Millions of dollars)								
	91/92	92/93	93/94	94/95	95/96	96/971	97/98²	
Total revenues	1,048	983	929	1,002	1,198	587	224	
Total expenditures	3,202	2,984	3,096	2,977	3,448	2,501	2,422	
Net Expenditures	2,154	2,001	2,167	1,975	2,250	1,914	2,198	
Cost recovery (%)	32.7	32.9	30.0	33.7	34.7	23.5	9.3	

<sup>1</sup> Starting in 1996/97, the air transport tax, formerly netted against Transport Canada budget is now credited to the government Consolidated Revenue Fund. In 1996/97 it amounted to \$737.2 million and estimated to be \$781.9 million in 1997/98. Since total expenditures include subsidies, these two sums have been subtracted from total expenditures for 1996/97 and 1997/98.

Source: Transport Canada, Finance Directorate

Beginning in 1996/97, that tax was credited to the Consolidated Revenue Fund. Revenues from it amounted to \$737 million in 1996/97, with estimates of \$782 million for 1997/98. Table 4-5 shows transport revenues credited to Transport Canada from 1991/92 to 1997/98.

In preparation for the privatization of the Air Navigation System (ANS), which took place in November 1996, the department also introduced an overflight fee in 1995 that resulted in higher revenues in 1995/96 and 1996/97 than in previous years. With the sale of the ANS to Nav Canada, Transport Canada's revenues from air navigation fees ceased on November 1, 1996. The air transportation tax was reduced on March 1, 1998 and will be discontinued by November 1, 1998. It will be replaced by user charges by Nav Canada based on full cost recovery.

With the loss of revenues from the air transportation tax, one of the most important sources of revenue for Transport Canada will be the leases paid by local entities looking after airport operations. By 1997/98, these revenues will account for almost 70 per cent of the department's total revenues despite the fact that, in absolute terms, this sum will be significantly less than it was in 1991/92.

#### COST RECOVERY LEVELS

Up until 1995/96, Transport Canada was recovering about one third of its expenditures, which include operations and maintenance, as well as capital expenditures and subsidies. In 1997/98, this percentage came down to 9.3 per cent. Table 4-6 shows Transport Canada's level of cost recovery since 1991/92.

<sup>1</sup> Starting in 1996/97, the air transport tax, formerly netted against Transport Canada budget is now credited to the government Consolidated Revenue Fund. In 1996-97 it amounted to \$737.2 million and estimated to be in the order of \$731 P million in 1997/98.

Forecast as at January 31, 1998 of full fiscal year actual expenditures.

# FEDERAL SUBSIDIES TO TRANSPORTATION

# DIRECT FEDERAL SUBSIDIES

For many decades, direct grants and contributions or payments to Crown corporations represented significant expenditures on transportation. Although recent policy changes have reduced some subsidies, such as those to VIA Rail, or eliminated many large ones, such as those for the transport of grain from Western Canada under the Western Grain Transportation Act (WGTA) and the Atlantic Region Freight Assistance (ARFA) program, some funds are still being paid out to ease the period of transition.

Subsidies are still being made as transition payments to the ARFA program to upgrade the road network in the Atlantic region and Eastern Quebec. In addition, the province of Newfoundland will receive some \$350 million in 1997/98 for taking over the Labrador Ferry services.

Large interim payments (the air transportation tax) are also being paid up to November 1998 to Nav Canada until it can put charging mechanisms in place to recover costs. Therefore, it is not surprising that subsidies to air, road and marine continue to appear high.

For rail services on the other hand, which until recently received the largest proportion of federal subsidies (66 per cent of all direct subsidies in 1993/94), the share has dropped to less than 15 per cent in 1997/98. Table 4-7 shows the total direct federal subsidies, grants and contributions from 1993/94 to 1997/98.

# TABLE 4-7 TOTAL DIRECT FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS – BY MODE

	(Millions of	of dollars)			
	93/94	94/95	95/96	96/97	97/98¹
Rail	1,044.7	1,015.2	567.2	280.6	259.3
Highways and bridges	232.5	243.4	284.9	317.1	321.6
Trucking	97.5	98.5	39.5	3.9	4.6
Ferries and marine facilities	170.9	183.5	166.9	148.1	480.0
Air	44.1	25.4	35.5	327.0	734.6
Other <sup>2</sup>	5.7	3.8	4.5	3.4	13.1
Total	1,595.4	1,569.8	1,098.5	1,080.1	1,813.2

<sup>1</sup> Forecast as at January 31, 1998 of full fiscal year actual expenditures.
2 Includes in 1997/98, \$13 million for RCMP withdrawal at international airports.

# TABLE 4-8 FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS RAIL TRANSPORTATION

	(Millions	of dollars)			
	93/94	94/95	95/96	96/97	97/981
Freight	683.3	696.1	248.1	24.9	28.8
WGTA	633.0	644.0	209.8	-	-
ARFA	9.4	9.3	2.2		-
Branch lines	15.3	17.4	9.7	-	1.4
Hopper cars	17.8	19.1	18.2	17.1	19.0
Other	7.8	6.3	8.2	7.8	8.4
Passenger	351.8	311.1	310.9	248.2	223.0
VIA	342.7	301.0	301.0	235.8	216.2
Non-VIA	8.9	9.9	9.7	12.2	6.6
Other	.2	.2	.2	.2	.2
Grade Crossings	9.6	8.0	8.2	7.4	7.5
Total - Rail	1,044.7	1,015.2	567.2	280.6	259.3

<sup>1</sup> Forecast as at January 31, 1998 of full fiscal year actual expenditures.

Source: Transport Canada, Finance Directorate

Source: Transport Canada, Finance Directorate

## TABLE 4-9 FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS HIGHWAYS AND BRIDGES

(Millions of dollars)								
	93/94	94/95	95/96	96/97	97/98¹			
Highway agreements	193.5	209.8	207.7	214.4	154.7			
Transition re ARFA <sup>2</sup>	-	-	48.7	74.8	103.4			
Northumberland Strait Crossing			-	-	37.8			
Other	3.3	1.0	-		-			
Total Highways	196.8	210.8	256.4	289.2	295.9			
Montreal bridges <sup>3</sup>	35.7	32.6	28.5	27.9	25.7			
Total – Highways and bridges	232.5	243.4	284.9	317.1	321.6			

- Forecast as at January 31, 1998 of full fiscal year actual expenditures.
   Atlantic Region Freight Assistance program
- 3 Jacques Cartier and Champlain Bridges Inc

Source: Transport Canada, Finance Directorate

## **TABLE 4-10** FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS TRUCKING

(Millions of dollars)									
	93/94	94/95	95/96	96/97	97/98 <sup>1</sup>				
		0 11 00		90/97	97/90				
ARFA	96.2	97.8	35.4	-	-				
National Safety Code	-	-	3.7	3.9	4.6				
Other <sup>2</sup>	1.3	0.7	0.4	-	-				
Total – trucking	97.5	98.5	39.5	3.9	4.6				

- Forecast as at January 31, 1998 of full fiscal year actual expenditures.
- 2 Grants to associations and institutes

Source: Transport Canada, Finance Directorate

#### Rail

Direct subsidies to rail were over one billion dollars in each of the two fiscal years 1993/94 and 1994/95. In those same years, payments under the Western Grain Transportation Act (WGTA) accounted for close to two thirds of total subsidies to rail and over 92 per cent of total subsidies to rail freight. Starting in 1996/97, this program was completely eliminated, as was the Atlantic Region Freight Assistance (ARFA) program. Combined with reductions to VIA Rail support (\$127 million over a four-year period), total rail subsidies dropped to \$281 million in 1996/97 and to \$259 million in 1997/98, or around 25 per cent of their peak value in 1993/94. Table 4-8 shows the federal government's subsidies made to the rail sector.

## **Roads and Bridges**

Over the last few decades, direct federal subsidies for highways and bridges have been primarily in the form of contributions under bilateral cost-sharing agreements with individual provinces, territories and (occasionally) municipalities. Subsidies totaled \$317 million in 1996/97 and are expected to increase to \$322 million in 1997/98, equal to their level in 1995/96. Without the transition payments to the Atlantic Region Freight Assistance program in 1997/98, that total would have accounted for about ten per cent of total federal transportation subsidies compared with 15 per cent in 1993/94. Table 4-9 shows federal subsidies made to highways and bridges from 1993/94 to 1997/98.

## Trucking

Subsidies to trucking activity shown in Table 4-10 are mainly identified as payments under the ARFA program, which was

eliminated in 1996. The table also shows payments to provinces and territories under agreements to implement National Safety Code provisions. Total direct subsidies to trucking are expected to represent less than half of one per cent of total federal transportation subsidies in 1997/98.

#### Marine

Although federal subsidies for ferries and marine facilities have dropped from \$171 million in 1993/94 to \$148 million in 1996/97, the beneficiary share of total federal transportation subsidies has increased from 11 to 14 per cent over the same period. Here again, subsidies have been either eliminated or substantially reduced. Over the fiscal period 1993/97, subsidies to ferries, dominated by payments to Marine Atlantic Inc., represented more than 75 per cent of total marine subsidies. In 1997/98, total ferry subsidies is dominated by a \$348 million one-time payment to the province of Newfoundland for the Labrador ferry services buyout. Without that payment, total subsidies for marine activities and ferries would total \$132 million. Table 4-11 shows federal subsidies for the marine sector.

#### Air

Subsidies to air activities include those to airports, aviation and Nav Canada. The National Airports Policy (NAP) of 1994 outlined plans for federally owned airports. Transport Canada will retain ownership of 26 major airports that make up the National Airports System (NAS). The operation of these airports, however, will be transferred to local airport authorities. Many of the NAS airports require no subsidies and those that do are still operated directly by Transport Canada. The

**TABLE 4-11** FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS MARINE TRANSPORT

(1	Millions o	f dollars)			
	93/94	94/95	95/96	96/97	97/981
Marine facilities and services					
Pilotage Authorities	7.3	4.3	5.1		-
Canartic Marine Inc.	2.7	-	-		
Canada Ports Corp.	.7	.9	1.9	2.5	0.7
St. Lawrence Seaway Authority		-	-	-	
Port Divestiture Fund		-	-	13.1 <sup>2</sup>	2.5
Other	1.5	1.8	10.1		3.4
Sub-total	12.2	7.0	17.1	15.6	6.6
Ferries					
Marine Atlantic Inc.	129.3	112.4	100.0	97.2	91.3
Nfld. South Coast ferries		31.0	19.0	5.0	
BC ferries	18.4	22.8	21.3	21.8	21.9
Bay of Fundy Ferry Services	-	-	-	-	3.3
Other East Coast ferries	11.0	10.3	9.5	8.5	9.3
Labrador ferry services buyout	-	-	-	-	347.6
Sub-total	158.7	176.5	149.8	132.5	473.4
Total – Ferries and Marine	170.9	183.5	166.9	148.1	480.0

- 1 Forecast as at January 31, 1998 of full fiscal year actual expenditures.2 This amount includes a \$10 million grant to Newfoundland for the operation of ports.

Source: Transport Canada, Finance Directorate

#### **TABLE 4-12** FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS **AIR TRANSPORT**

(Millions of dollars)								
	93/94	94/95	95/96	96/97	97/98¹			
Airports								
Non-NAS <sup>2</sup> airport operations	14.2	12.0	7.5	4.7	3.4			
Local airports	14.6	8.0	10.0	.8	.2			
Non-NAS airports under NAP 3	-		11.5	16.3	18.1			
Airport Capital Assistance Prog.	-	-	1.7	9.4	22.2			
Other 4	14.3	4.9	4.5	3.9	4.6			
Total - Airports	43.1	24.9	35.2	35.1	48.5			
Aviation	1.0	.5	.3	.2	.3			
Nav Canada		-	-	291.7	685.8			
Total - Air	44.1	25.4	35.5	327.0	734.6			

- 1 Forecast as at January 31, 1998 of full fiscal year actual expenditures.
- 2 National Airports System3 The National Airports Program
- Includes in 1993-94, a subsidy of \$13.3 million to other airports

Source: Transport Canada, Finance Directorate

TABLE 4-13
FEDERAL EXPENDITURES
ON TRANSPORT FACILITIES AND SERVICES 1

/8.4		alalla ua\						
(Millions of dollars)								
	93/94	94/95	95/96	96/97	97/981			
Airports operations (NAS <sup>2</sup> and non-NAS)								
Operating expenditures	244.5	245.3	238.3	255.3	120.5			
Capital expenditures 3	135.8	146.0	135.7	123.4	57.0			
Total gross airports operations	380.3	391.3	374.0	378.7	177.5			
Less revenues	(291.3)	(303.3)	(367.9)	(324.6)	(156.5)			
Airports operations – Net Exp.	89.0	88.0	6.1	54.1	21.0			
Air navigation system	128.2	96.1	29.6	363.7	N/A			
Harbours and ports	114.2	109.4	90.2	79.1	19.1			
Coast Guard services 4	588.8	530.8	524.1	517.6	499.1			
Total	920.2	824.3	650.0	1,014.4	539.2			

- 1 Forecast as at January 31, 1998 of full fiscal year actual expenditures.
- 2 National Airports System

3 Includes in 1996–97 \$2.1 million of statutory spending

4 Includes expenditures on marine navigation systems, icebreaking and Arctic operations, search and rescue and fleet management.

Source: Transport Canada, Finance Directorate; Federal Department of Fisheries and Oceans

net costs of their operation therefore are reflected as direct expenditures and discussed in that section of this chapter.

The department is also transferring both ownership and operational responsibility for regional, local and small airports to local authorities. Airports that have been transferred will continue to receive subsidies for a certain number of years. Contributions to the International Civil Aviation Organization (ICAO) and smaller amounts paid in accordance with other international agreements for air navigation and airways are shown under Aviation in Table 4-12.

As for Nav Canada, it will continue to receive the proceeds of the air transportation tax as a form of subsidy until its own fee schedule for overflight traffic is in place. If payments to Nav Canada are excluded for the fiscal periods 1996/97 and 1997/98, total air subsidies in those two years amount to \$35 and \$49 million, respectively.

# OTHER TRANSPORT FACILITIES AND SERVICES PROVIDED AT FEDERAL GOVERNMENT EXPENSE

# **Indirect Subsidies to Transportation**

Apart from the direct subsidization of services through money transfers to other entities, certain transportation facilities and services are provided through direct federal operations and funded through specific departmental or agency budgets. However, in recent years, Transport Canada's role in the operation of various elements of the transportation system has diminished, as have the department's expenditures on airports, air navigation services, and harbours and ports. In addition to this, when the direct user of a service is clearly identified, fees have either been instituted or increased, reducing net expenditures even further. Furthermore, cost efficiencies related to the integration of

Canadian Coast Guard operations with the Department of Fisheries and Oceans have helped cap expenditures on many operations. Table 4-13 shows federal spending on transportation facilities and services from 1993/94 to 1997/98.

# Federal Compensation for Imposed Public Duties

When the government's role with respect to transportation was one of regulating the industry (economic regulation), it was also directly subsidizing transportation services in specific geographic areas that could not be serviced without the carrier incurring a loss. Subsidized services were considered to be in the public interest. Services that fell into this category were referred to as "imposed public duties." Legislative and administrative mechanisms, such as those in the National Transportation Acts of 1967 and 1987, the Railway Act, and the Western Grain Transportation Act, were put in place to specify which services were required of carriers as public duties, and to determine the amount of compensation for which they were eligible.

Until recently, compensation to rail carriers by the federal government for statutorily imposed public duties consisted of payments for western grain transport under the Western Grain Transportation Act; subsidies to railways for the continued operation of unremunerative branch lines under section 178 of the National Transportation Act. 1987; and subsidies to railways for the operation of unremunerative passenger services under section 290 of the Railway Act (other than those to VIA Rail Canada, which as a Crown corporation received direct budgetary funding). With the

TABLE 4-14 PROVINCIAL GOVERNMENT EXPENDITURES ON TRANSPORTATION							
	(Millions of	dollars)					
	91/92	92/93	93/94	94/95	95/96	96/97	
Air	117.4	99.3	90.0	89.3	105.0	102.7	
Water	168.7	142.5	126.0	131.4	100.5	92.5	
Rail	15.8	15.5	21.8	19.3	26.7	10.8	
Highways	6,143.6	5,885.0	5,801.8	6.079.1	6.214.2	5,787.8	
Transit	1,368.7	1,212.8	1,214.7	1,308.0	1.286.9	1,275.3	
Multimodal	209.8	207.6	208.0	196.3	198.9	164.6	
Total gross transportation expenditures	8,024.1	7,562.7	7,462.4	7,823.4	7,932.1	7,433.7	
less federal transfers	153.5	126.1	232.6	265.3	329.1	264.8	
Total net transportation expenditures	7,870.6	7,436.6	7,229.8	7,558.1	7,603.0	7,168.8	
Per cent of total provincial expenditures	5.4%	4.9%	4.8%	4.9%	4.8%	4.7%	
Source: Provincial and Territorial Departments of Transportation.							

elimination of the Western Grain Transportation Act and the introduction of the Canada Transportation Act, all such payments to rail carriers were eliminated.

Statutory payments for imposed public duties exist for ferry services such as between North Sydney, Nova Scotia, and Port-aux-Basques, Newfoundland. Such payments to ferry services are not so much reflecting an "imposed public duty" but constitutional obligations. Subsidies for these services are included in Table 4-11 under Marine Atlantic Inc. and amount to \$23.4 million in 1996/97 and \$26.3 million in 1997/98.

# PROVINCIAL Expenditures

In 1996/97, provincial and territorial governments spent about \$7.4 billion on transportation. The amount of this spending has fluctuated between this level and \$8 billion over the past six years. Both operating and maintenance (including salaries) and capital

expenditures accounted for about 36 per cent each of their total gross spending in 1996/97, while transfers accounted for 27 per cent. (Many provinces have moved to unconditional grants to municipalities and, in many cases, it is no longer possible to trace amounts spent on transportation. For this reason transfers spent on transportation may be underreported.)

Spending on highways is by far the most important and amounted to \$5.8 billion in 1996/97 or about 78 per cent of the total spending. This proportion has remained more or less constant over the past five years. Spending on transit is the next most important and amounted to \$1.3 billion in 1996/97, it has remained at about 17 per cent of total spending during the past five years. Like total provincial transportation spending on both highways and transit have fluctuated over the past six years not showing any real trend while spending for the other modes as well as multimodal spending have all declined. Multimodal spending includes specific spending on more than

one mode of transport as well as general departmental administration expenditures.

Federal transfers to the provinces and territories for transportation were \$265 million in 1996/97 and constituted only about 3.6 per cent of gross provincial/territorial transportation spending. Federal transfers have risen ten per cent a year over the past five years. The main increase has been since 1993/94 and reflects road agreements as well as transition payments in relation to the phase-out of the Atlantic Freight Rates Program.

Provincial and territorial transportation spending, net of federal transfers, was \$7.2 billion in 1996/97. This sum accounted for about 4.7 per cent of their total government spending. This percentage has been falling in recent years. By province, this percentage varies from a low of three per cent in Newfoundland and Quebec to a high of 11 per cent in the Yukon. It is five per cent in Ontario (Table 4-14).

TABLE 4-15  LOCAL GOVERNMENT EXPENDITURES  ON TRANSPORTATION								
(Millions of dollars)								
	1991	1992	1993	1994	1995	1996		
Roads and streets	5,967.1	5,949.8	6,087.2	6,365.7	6,674.3	6,037.5		
Public transit	1,296.8	1,557.4	1,504.4	1,532.2	1,611.0	1,636.2		
Other transportation	101.0	96.3	111.7	97.6	123.3	137.8		
Gross expenditures	7,364.9	7,603.6	7,703.3	7,995.6	8,408.5	7,811.4		
Less transfers	1,715.2	1,741.9	1,762.6	1,989.1	2,235.2	1,732.7		
Provincial	1,695.1	1,714.6	1,743.4	1,900.9	2,070.4	1,618.6		
Federal	20.1	27.3	19.3	88.3	164.8	114.1		
Net expenditures	5,649.8	5,861.7	5,940.7	6,006.5	6,173.3	6,078.7		
Source: Statistics Canada, Public Institutions	s Division, unpublished data.							

# LOCAL GOVERNMENT EXPENDITURES

In 1996, local governments in Canada spent a total of \$7.8 billion on transportation. If the \$1.7 billion in transfers from other levels of government is taken out, net local governments expenditures on transportation totaled \$6.1 billion. Over the period 1991 to 1996, local government expenditures grew at an average annual rate of 1.2 per cent. They reached a maximum of \$8.4 billion in 1995. Spending on roads and streets have been falling in relative terms while transit related expenditures have increased slightly. Spending on roads and streets accounted for approximately 77 per cent of total local government expenditures. Transfers to local governments were \$1.7 billion in 1996, about the same as in 1991, although they rose significantly in 1994 and 1995. This increase came from the Special Infrastructure Program and the resulting increase in federal transfers to local governments in the past three years (Table 4-15).

# Infrastructure and Associated Services

As a result of recent years' investment, major transportation infrastructure became operational in 1997, for instance the Vancouver Deltaport container facility, the electronic toll highway 407 in Ontario, and the Confederation Bridge linking Prince Edward Island to the mainland. Transfers and leasing of lines dominated rail rationalization activities.

Canada's transportation infrastructure is a vast network covering the country's landscape, which extends over some nine million square kilometres. The system includes over 900,000 kilometres of road, 50,000 route-kilometres of rail lines, approximately 1,800 registered aerodromes (646 of which are certified as airports), over 300 commercial ports and harbours, more than 2,000 fishing and recreational harbours, and the St. Lawrence Seaway.

It also includes an air navigation system that guides air traffic over Canadian airspace, as well as marine navigation and protection services provided by the Canadian Coast Guard from 11 bases across the country. In addition, four pilotage authorities provide pilotage services to and from Canada's major ports.

Each element of this transportation infrastructure is a real-property asset requiring maintenance and upkeep, as well as investment of resources to accommodate growth and evolving needs.

This chapter describes the system and its utilization, and gives an overview of the most recent developments in Canada's transportation infrastructure, including institutional changes involving commercialization,

contracting out, and legislative and regulatory reform.

# Major Events in 1997

## **AIR NAVIGATION SYSTEM**

In its first year of operation in 1997, Nav Canada submitted and received approval for Phase One of its proposed fee structure implemented on March 1, 1998. Phase Two has November 1, 1998 as the target date for implementation. The Air Transportation Tax is being eliminated to make way for these direct charges to users.

#### **AIRPORTS**

Local airport authorities took over operations of local airports in Victoria, Winnipeg, Thunder Bay, Ottawa and Moncton in 1997. Currently more than 90 per cent of all passenger traffic in Canada passes through airports operated by local airport authorities.

Over the past year, the airport authorities, both new and old, were busy:

- The Greater Toronto Airports
   Authority purchased Terminal 3
   and selected a design consortium
   for the redevelopment of the
   other two terminals at Pearson
   airport. A new parallel
   north–south runway began
   operations in November.
- Aéroports de Montréal announced a second phase of construction at Dorval.
- Vancouver International Airport Authority announced plans for a \$114-million expansion.
- Ottawa's Macdonald-Cartier
   International Airport opened a
   new facility for US customs and
   immigration pre-clearance.
   Seven Canadian airports now
   have pre-clearance for
   passengers on US-bound flights,
   including Montreal (Dorval),
   Toronto (Pearson), Winnipeg,
   Calgary, Edmonton and
   Vancouver.
- The Calgary Airport Authority began a \$28-million capital program, including improvements to vehicle parking, Canada Customs space and aircraft parking.
- The Edmonton Regional
   Airports Authority began work
   on a terminal redevelopment
   program at the international
   airport.

#### **PORTS**

A notable event during the past year occurred when the Port of Vancouver officially opened its Deltaport Container Terminal on June 25, 1997, doubling the port's container handling capacity to 1.2 million Twenty-Foot Equivalent Units. The new facility can handle the largest container vessels currently in service and transfer containers to double-stack rail cars for immediate dispatch to Central Canada and the US Midwest.

Another notable event occurred when the federal government transferred the Port of Churchill to the Hudson Bay Port Company, an affiliate of OmniTRAX Inc., on September 4, 1997. OmniTRAX also owns the Hudson Bay Railway, which acquired 1,300 kilometres of rail line to Churchill previously owned by Canadian National.

# St. Lawrence Seaway

Negotiations between the Minister of Transport and the Seaway Users' Group in pursuit of a commercialization agreement continued in 1997. Completion of the agreement is expected in mid-1998.

#### CANADIAN COAST GUARD

Following introduction of the Marine Navigation Services Fee in 1996, the Canadian Coast Guard (CCG) continued its efforts to reduce expenditures and improve efficiency by introducing a new fee in 1997: the Maintenance Dredging Services Tonnage Fee for the St. Lawrence Ship Canal.

#### RAIL

In 1997, five shortline corporations, currently dominating that sector of the rail industry,

added over 3,000 kilometres of track to their networks, primarily as a result of transfers or leasing agreements with CN and CP Rail.

## ROADS

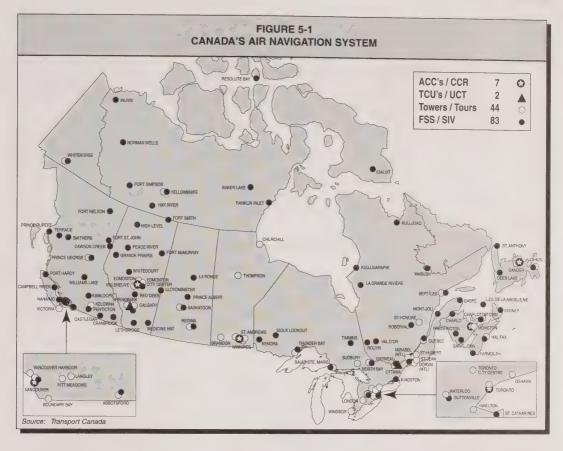
The highlight of 1997 was the June opening of the Confederation Bridge between Prince Edward Island and New Brunswick. Other road-sector activity included the transfer of provincial roads to municipal responsibility. In Ontario a completely electronic toll highway was opened to traffic, Highway 407.

# Air Transportation Infrastructure

# AIR NAVIGATION SYSTEM

The Canadian Air Navigation System (ANS) consists of seven area control centres (ACC), 44 air traffic control towers, 83 flight service stations (FSS), and a network of 1,400 electronic navigational aids. One of the safest and most extensive networks of air infrastructure in the world, this system delivers air traffic control and related airspace services to aircraft operators, supporting 6.8 million aircraft movements a year. Figure 5-1 pinpoints the locations of the network components across the country.

Nav Canada, a private, not-for-profit corporation, assumed responsibility for all civil air navigation services on November 1, 1996. The transfer included air traffic control, aeronautical telecommunications, aeronautical information and aviation weather services. The corporation agreed to pay the federal government \$1.5 billion in cash and assume some continuing liabilities and responsibilities.



The Minister of Transport retains as a mandate the safety oversight of Nav Canada's operations, by ensuring that all safety and regulatory requirements continue to be met. While Nav Canada and the Minister of Transport share responsibility for air navigation safety, the Minister remains responsible for ensuring that safety is not compromised by Nav Canada's decisions. In addition, the Minister is responsible for ensuring that changes to the Air Navigation System do not adversely affect service to northern and remote areas, as specified in the Civil Air Navigation Services Commercialization Act.

# **Air Navigation Operations**

#### Restructuring

In September 1997, Nav Canada announced its "Corporate Direction," which involves reducing the corporation's current 6,300 employee positions by 1,000 over three years. It expects to achieve an 18 per cent reduction in operating costs from its restructuring and downsizing, which are matters for Nav Canada to determine in accordance with the requirements of the *Civil Air Navigation Act*, and the *Aeronautics Act* and its associated regulations.

Table 5-1 shows the workloads of the air navigation system resources and the air traffic

controllers providing navigation services to air traffic in Canada. See Appendix 5-1 for details on aircraft movements at major Canadian airports.

### **Financial Performance**

#### **Proposed User Charges**

As a not-for-profit corporation, Nav Canada must price its services to recover all costs from users, including any debt-servicing costs. Nav Canada reached an important milestone in establishing a long-term revenue base when it completed extensive consultations on a proposed package of user charges in 1997. Included in this package are the introduction of terminal control charges and domestic en route charges, as well

TABLE 5-1	
CANADA'S AIR NAVIGATION SYSTEM WORKLOAD STATISTICS	
1991 – 1997	

	Airc	craft Movements <sup>1</sup>	Air	Aircraft		
	With Tower	With FSS <sup>2</sup>	Other Airports	TOTAL	Traffic Controllers	Movements <sup>1</sup> per Controller
1991	5,540,273	1,169,462	574,344	7,284,079	1,619	4,511
1992	5,265,551	1,096,362	675,822	7,037,735	1,744	4,035
1993	4.952.657	1,114,410	711,888	6,778,955	1,854	3,656
1994	4,917,805	1,130,614	809,918	6,858,337	1,908	3,595
1995	4,729,817	1,339,980	762,347	6,832,144	1,957	3,491
1996	4,794,698	1,265,872	679,397	6,739,967	1,947	3,462
1997	4,996,850	1,315,230	692,172	7,004,252	2,209	3,171

<sup>1</sup> Aircraft movements = arrivals and departures of aircraft 2 FSS = Flight Service Stations

Source: Transport Canada, Aircraft Movement Statistics, TP577, 1995-97

as increases in the oceanic and overflight charges. These latter charges had been introduced by the federal government prior to the transfer.

Nav Canada submitted its proposed structure to the Minister of Transport in early August for approval. The Minister approved the charges in early September, after determining they were consistent with the charging principles set out in the Civil Air Navigation Services Commercialization Act. These changes will take effect on March 1, 1998, rather than November 1, 1997, as originally scheduled, to give air carriers more time to adjust to charges imposed directly on them. Previously, carriers acted only as agents in collecting the Air Transportation Tax from passengers.

Nav Canada set the new charges at levels necessary to achieve approximately 50 per cent cost recovery. At the same time, the federal government will reduce the current Air Transportation Tax by almost 50 per cent.

A second round of charging proposals will be prepared for implementation on

November 1, 1998, when the Air Transportation Tax will be completely eliminated and replaced by Nav Canada's charges.

#### A Good First Year

Financially, Nav Canada obtained the highest bond rating of any private sector organization in Canada. The corporation's initial debt offering, which amounted to \$3 billion, was the largest such offering in Canadian history.

Nav Canada has performed beyond expectations in its first year of operation: for the fiscal year ended August 31, 1997, which covered a 10-month period of operation from November to August, revenues were \$776 million; operating expenses, \$584 million; interest and depreciation, \$121 million; and one-time restructuring costs, \$57 million.

# **AIRPORTS**

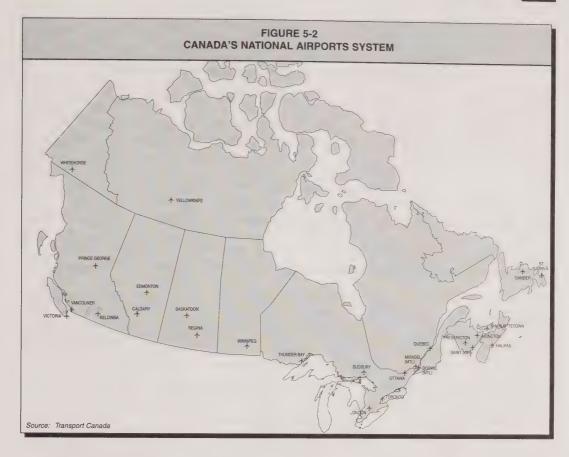
Canada has approximately 1,800 "aerodromes," the generic name for facilities registered with Transport Canada as aircraft landing and take-off sites. Of these, 646 are certified as either airports for fixedwing aircraft, heliports for

helicopters, or water-ice bases for float- and ski-planes. Most of Canada's commercial aviation activity takes place at certified "airports." Some aerodromes are privately owned, but the vast majority of certified airports are owned by municipalities, provincial/territorial governments, or the federal government.

In terms of size and complexity, Canada's certified airports run the gamut from basic sites with a single runway and one or two multi-purpose buildings, to large airport complexes with multiple runways, aircraft hangars, cargo warehouses, and customs. immigration and agricultural inspection facilities.

Airport terminal buildings also accommodate an array of services for the comfort, security and convenience of passengers and airport employees. Private-sector companies lease space and/or pay concession fees to the owner or operator of the airport to provide these services.

The federal government's 1994 National Airports Policy calls for the commercialization of most federally owned airports by March 31, 2000.



Under the Policy, the federal government will retain ownership of each of the 26 airports that make up Canada's National Airports System (NAS), transferring the operations of all but two of them to Canadian notfor-profit airport authorities through long-term leases. The governments of the Northwest Territories and Yukon have taken control of the National Airports System airports at Yellowknife and Whitehorse respectively. Figure 5-2 shows the locations of the 26 airports in the system.

Transport Canada transferred five airports in the national airports category to airport authorities in 1992: Vancouver, Calgary, Edmonton, Mirabel and Dorval. The department transferred six others in 1996 and 1997. The Greater Toronto Airports Authority took over operation of Canada's busiest airport, Lester B. Pearson International Airport, in 1996. In 1997, local authorities took over operation of the airports in Victoria, Winnipeg, Thunder Bay, Ottawa and Moncton.

Transport Canada is transferring ownership of the 70 **regional/local airports** to local interests by way of sale. As of December 31, 1997, Transport Canada had transferred 46 airports, with 24 remaining.

Transport Canada is also transferring the 25 small and satellite airports that do not have scheduled passenger services to local interests. By the end of 1997,

19 airports had been transferred, and six remained under negotiation.

The twelve **remote airports** providing year-round access to isolated communities will continue to receive federal assistance. The government's long-term role in these airports will be reviewed.

Transport Canada has transferred the 11 Arctic airports to their respective territorial governments.

# AIRPORT TRAFFIC

Annual passenger traffic at Canadian airports grew by over 12 per cent in 1996. Airports in the National Airports System experienced the most growth, with

TABLE	5-2	
PASSENGER TRAFFIC AT	CANADIAN	AIRPORTS
1991 -	1996	

Total Enplaned/Deplaned Passengers by Airports Category – (as defined in NAP – July 1994)												
Airports Category	1991	% of Total	1992	% of Total	1993	% of Total	1994	% of Total	1995	% of Total	1996	% of Total
NAS	55,210,647	93.14	56,744,047	93.57	56,165,480	93.82	57,115,452	93.93	60,904,871	94.17	68,717,794	94.80
Regional/Local	3,539,158	5.97	3,405,660	5.62	3,214,143	5.37	3,223,288	5.30	3,297,254	5.10	3,309,159	4.57
Small	. 24,611	0.04	17,213	0.03	9,210	0.02	364	0.00	1,078	0.00	1,045	0.00
Satellite	188	0.00	7,260	0.01	9,610	0.02	10,283	0.02	13,984	0.02	15,703	0.02
Remote	253,436	0.43	238,694	0.39	242,341	0.40	235,910	0.39	232,231	0.36	222,789	0.31
Arctic	247,876	0.42	230,368	0.38	225,269	0.38	224,304	0.37	228,317	0.35	218,007	0.30
Total*	59,275,916	100.00	60,643,242	100.00	59,866,053	100.00	60,809,601	100.00	64,677,735	100.00	72,484,497	100.00

Note: \* Excludes other airports not included in NAP – July 1994.
Whitehorse and Yellowknife are included in NAS category only.

Source: Statistics Canada, Statements 2, 4 and 6.

traffic increasing by 12.8 per cent. Of these, Pearson experienced 8.4 per cent growth, Edmonton 63 per cent (as a result of re-structuring of the city's airports), Calgary 25.9 per cent, Winnipeg 23.1 per cent, and Victoria 21 per cent. However, Gander experienced a decrease of 16 per cent. Table 5-2 shows passenger traffic at Canadian airports. For more detail on passenger traffic at National Airports System airports, see Appendix 5-2.

Cargo traffic at Canadian airports has also tended to increase since the recession in the early 1990s. In 1996, cargo traffic increased by 4.8 per cent from 1995. There were notable variations in this growth, with Gander experiencing a 72 per cent increase, followed by London with 66.6 per cent, Victoria with 22.4 per cent, Calgary with 21.8 per cent and St. John's with 15.9 per cent. Pearson International experienced growth of 5.1 per cent, while airports such as Quebec (-43.5 per cent) and Thunder Bay (-40.4 per cent) faced large declines in cargo traffic. Table 5-3

shows cargo traffic at Canadian airports. For more detail on cargo traffic at National Airports System airports, see Appendix 5-3.

# FINANCIAL PERFORMANCE

In 1997/98, Transport Canada forecasts spending \$227.4 million on the operation of airports, including operating costs, subsidies and capital, while taking in revenues of \$84.0 million. The department also forecasts receiving an additional \$69.4 million in rent from the 10 airport authorities.

# Local Airport Authorities Revenues and Expenses

National Airports System airports are expected to be fully self-sufficient. The airport authorities, which are incorporated as not-for-profit organizations with no equity shareholders, fund their operations and any expansions/improvements from revenues derived from airport users (airlines, concessionaires, passengers, etc.) and private investors. The airport authorities also pay rent to the federal government, as the owner of the airport. All net earnings are

reinvested in airport operations and assets. Airport authorities are required to issue annual reports, including financial statements. Table 5-4 summarizes financial results reported by the four Local Airport Authorities created in 1992 (Vancouver, Calgary, Edmonton and Montreal).

Airport authorities' revenues are derived from four main sources: concession fees, airside fees, airport improvement fees and miscellaneous revenues. Airports incur expenses mainly for materials and services, rent, and staff wages and benefits.

In recent years, airport improvement fees collected from passengers have become an important and growing contribution to cash flow, used to fund capital improvements, e.g. the new terminal at the Vancouver airport. Edmonton and Calgary added airport improvement fees in 1997, and similar fees are expected at other airports in the future.

From 1993 to 1996, the four local airport authorities increased revenues from \$264 million to

## TABLE 5-3 CARGO TRAFFIC AT CANADIAN AIRPORTS 1991 – 1996

Total Enplaned/Deplaned Cargo (kg) by Airports Category - (as defined in NAP - July 1994)

									,	,		
Airports Category	1991	% of Total	1992	% of Total	1993	% of Total	1994	% of Total	1995	% of Total	1996	% of Total
NAS	690,258,256	97.28	675,025,540	98.42	701,796,167	98.73	701,340,112	98.20	709,907,815	97.98	749,122,057	98.60
Regional/Local	12,649,988	1.78	4,930,111	0.72	4,451,785	0.63	7,951,874	1.11	9,376,349	1.29	6,584,645	0.87
Small	260,500	0.04	132,000	0.02	214,100	0.03	88,600	0.01	146,900	0.02	97,100	0.01
Satellite						-				-		
Remote	1,531,806	0.22	1,170,245	0.17	694,055	0.10	544,302	0.08	558,330	0.08	795,143	0.10
Arctic	4,846,954	0.68	4,635,594	0.68	3,662,166	0.52	4,294,342	0.60	4,533,660	0.63	3,131,005	0.41
Total*	709,547,504	100.00	685,893,490	100.00	710,818,273	100.00	714,219,230	100.00	724,523,054	100.00	759,729,950	100.00

Note: \* Excludes other airports not included in NAP – July 1994 Whitehorse and Yellowknife are included in NAS category only.

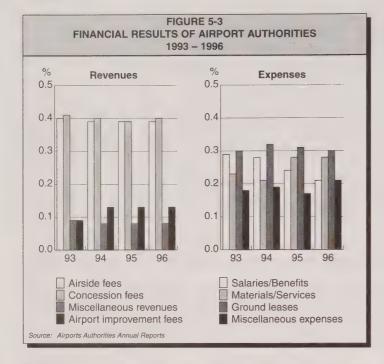
Source: Statistics Canada, Statements 2 and 6.

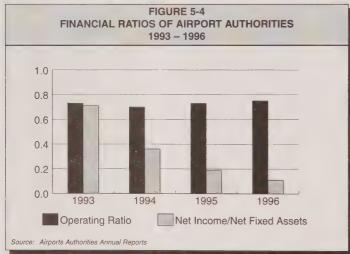
# TABLE 5-4 TOTAL REVENUES AND EXPENSES OF CANADA'S AIRPORT AUTHORITIES 1993 – 1996

			Оре			Net Income/	
Airports		Revenues	Expenses	Income	Ratio	Net Income	Net Fixed Assets
Vancouver	1993	107.0	71.0	36.1	0.66	36.0	0.51
	1994	128.4	75.2	53.1	0.59	53.4	0.32
	1995	146.4	87.6	58.9	0.60	58.5	0.16
	1996	189.7	122.2	67.5	0.64	41.2	0.09
Calgary	1993	39.9	30.4	9.5	0.76	9.3	0.68
	1994	40.9	32.7	8.2	0.80	8.1	0.40
	1995	46.9	38.9	8.0	0.83	7.7	0.28
	1996	53.2	43.0	10.2	0.81	10.0	0.24
Edmonton	1993	15.0	16.5	-1.5	1.10	3.2	0.65
	1994	15.9	17.3	-1.4	1.09	3.8	0.38
	1995	18.1	18.4	-0.2	1.01	5.1	0.36
	1996	24.3	26.0	-1.7	1.07	2.7	0.08
Montreal/Mirabel	1993	101.9	73.4	28.5	0.72	26.7	1.55
	1994	103.0	77.5	25.6	0.75	24.5	0.47
	1995	109.9	88.2	21.8	0.80	21.0	0.27
	1996	113.3	94.4	18.9	0.83	18.4	0.15
Total Major LAA's	1993	263.8	191.3	72.5	0.73	77.1	0.71
	1994	288.2	202.7	85.5	0.70	89.8	0.36
	1995	321.4	233.1	88.4	0.73	92.3	0.19
	1996	380.5	285.6	94.9	0.75	72.3	0.11

Note: With the exception of ratios, the unit is millions of dollars. Only the airports transferred in 1992 to Airport Authorities are covered here.

Source: Airports Authorities Annual Reports





\$381 million, or 44 per cent. This increase was not distributed evenly among the airports, but ranged from 11 to 77 per cent. As revenues were increasing, concession and airside fees remained steady, contributing 40 per cent each to total revenues,

a proportion which varied widely from airport to airport.

Airport improvement fees contributed about one quarter of Vancouver's revenues in 1996. The other airports did not have such fees in place as of the end of 1996. As a group, the distribution of expenses at the four airports shifted only slightly from 1993 to 1996.

For the most part, changes in revenues and expenses at the four airport authorities occurred as passenger volume increased from just under 24 million in 1993 to just under 32 million in 1996, a growth of 34 per cent. For the National Airports System airports as a whole, passenger volume increased in fact by 46 per cent.

For the group, revenue per passenger also increased by eight per cent from \$11 in 1993 to \$12 in 1996. Expenses per passenger rose slightly more from \$8 in 1993 to \$9 in 1996, or by 12 per cent. Comparatively speaking, inflation was slightly more than six per cent for the air industry from 1993 to 1996, compared with about nine per cent in the economy as a whole.

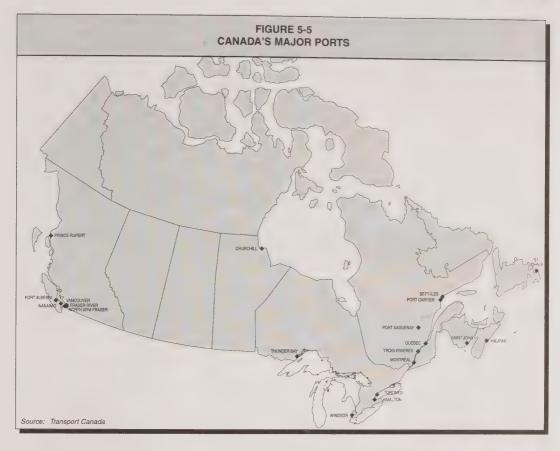
For the four airport authorities, operating expenses increased by 49 per cent over the same period, slightly more than revenues. Again the distribution was not uniform.

Overall, the operating ratio for the group increased by less than four per cent to 75 per cent, and net income declined by four per cent. Figure 5-4 shows stable operating ratios and declining returns on assets over the same period.

A noticeable change from 1993 to 1996 was the rise in their cash flows and capital expenditures. Overall, funds from operations increased by 61 per cent.

As cash flow improved and borrowing capacity increased, their capital expenditures also grew substantially.

Overall, their total assets almost tripled from 1993 to 1996, although the return on assets



declined because increased cash flows were directed toward airport improvements.

#### Airport Capital Assistance Program

An integral part of the National Airports Policy is the Airport Capital Assistance Program.
Transport Canada established this contribution program in April 1995 to assist eligible airports in financing capital projects related to safety, asset protection and operating-cost reduction. To be eligible, the airports must receive regularly scheduled passenger service, meet airport certification requirements and not be owned by the federal government.

In 1997, 46 projects at 39 airports were approved for funding. The total estimated cost was approximately \$40 million, with some of the projects to be implemented over two- and threeyear periods. Approved projects included the rehabilitation of runway, taxiway and apron pavements; the purchase of mobile equipment, such as runway sweepers and snowblowers; the purchase and installation of visual aids; the repair of airport terminal building roofs; and the installation of security fencing. Appendix 5-4 details approved projects and their costs.

#### Marine Transportation Infrastructure

Canada's marine infrastructure services three coastlines and the Great Lakes/St. Lawrence Seaway system. Figure 5-5 shows the locations of Canada's major marine infrastructure.

#### **PORTS**

Each of Canada's major ports is a terminus for railways and roads that carry goods for export or import, and passengers to or from their destinations throughout the country and even the continent. Cargo and passengers move through marine terminals that contain a variety of facilities and organizations related to the loading and unloading of vessels berthed at the wharf. In some cases, port authorities operate marine terminals, although often they are owned and operated by independent companies that rent space from the port.

#### **Current Port System**

At the end of 1997, Canada's ports system comprised a variety of facilities that fell under different jurisdictions: 13 ports operated by local port corporations and divisional ports that form Ports Canada; nine Harbour Commissions; 272 sites administered by Transport Canada; 2,000 recreational and fishing harbours operated by the Department of Fisheries and Oceans; and 37 ports operated by municipal governments and private interests.

#### **Proposed Ports Structure**

Under the National Marine
Policy announced in December
1995, Canada's ports system and
the operations of the St. Lawrence
Seaway are being commercialized.
The federal government is moving
out of direct operation of ports,
giving local users more say in the
port services they pay for and
receive. The National Marine
Policy calls for three categories of
ports: Canada Port Authorities,
regional/local ports, and remote
ports.

The proposed Canada Marine Act provides the framework under which the National Marine Policy will be implemented. Transport Canada began commercializing ports under its control in 1996, prior to the introduction of the Act, because legislative authority was not required for this process to begin.

Called Canada Port
Authorities under the proposed
Canada Marine Act, the 18
self-sufficient ports in the system
that are critical to domestic and
international trade will include
Ports Canada local port
corporations, major Canada Ports
Corporation divisional ports, and
most harbour commissions.

A second category of ports under the *Canada Marine Act*, called **regional/local ports**, includes Transport Canada facilities not considered to be remote facilities, as well as any Canada Ports Corporation facilities or harbour commissions not incorporated as Canada Port Authorities. Regional/local ports are being transferred to other federal departments or to provincial governments, municipal authorities, community organizations or private interests.

The transfer of regional/local ports began in 1996 under the National Marine Policy with the devolution of 277 sites and continued in 1997. In that year Transport Canada divested 34 facilities including: 16 to the Province of Newfoundland, two to the Province of New Brunswick, five to municipal authorities, seven to other local private interests, and two to other federal departments. In addition, two sites were demolished.

By the end of 1997, a total of 311 public ports had been transferred, deproclaimed or demolished. A total of 238 remain.

The federal government will continue to maintain **remote ports** that serve the basic transportation needs of isolated communities unless the department finds ways to make operations more efficient and opportunities to transfer these sites. At the end of 1997,

Transport Canada administered 34 remote ports in Quebec, Ontario, Manitoba and British Columbia.

A growing number of "other" ports are to be operated by provincial or municipal governments and private interests as Transport Canada divests itself of its facilities. The Department of Fisheries and Oceans, for example, owns over 2,000 harbours used for commercial and recreational boating under the *Fishing and Recreational Harbours Act*. At the end of 1997, there were an additional 77 of these "other" ports, including 30 private, 31 provincial and 16 municipal.

#### **Port Traffic**

Preliminary 1997 traffic data has been released by a number of individual ports:

- The Port of Vancouver handled 73.5 million tonnes and 816,537 passengers.
- The Port of Prince Rupert handled 13.1 million tonnes.
- The Port of Montreal reported total traffic of 20.7 million tonnes, with container traffic increasing 3.4 per cent over that of 1996.
- At the Port of Sept-Îles, a total of 24.5 million tonnes of traffic was reported.
- Halifax Port Corporation handled 14.1 million tonnes.
- At the Port of Saint John, total traffic exceeded 21 million tonnes.

#### Port Traffic Statistics

Based on Statistics Canada data, which is available only up to 1996, Canada's ports handled a total of 357.7 million tonnes of cargo in 1996, a slight decrease from the 361 million tonnes handled in 1995.

Ports Canada's ports handled the largest share (51 per cent) of Canada's 1996 commercial port traffic, while 12 per cent was transported through harbour commissions' ports. Another 20 per cent of the cargo was moved through Transport Canada facilities. The remaining 17 per cent was handled by other facilities, including those managed privately and those managed by or on behalf of the Department of Fisheries and Oceans and provincial and municipal governments.

Table 5-5 provides details of tonnage handled at Canada's ports, harbour commissions, and selected Transport Canada and "other" facilities. See also Appendix 5-5.

In percentages that compare 1995 with 1996 traffic, Ports Canada ports, harbour commissions and "other" ports saw traffic increase by one per cent, while Transport Canada ports saw a decrease of seven per cent. Overall, total tonnage decreased by one per cent in 1996 compared with 1995.

At those declared public harbours where Transport Canada has no facilities and cargo is transported across private wharves, cargo shipped totaled 21.9 million tonnes, or 31 per cent of the total traffic handled by Transport Canada's ports.

In total, 62.2 million tonnes crossed "other" ports. In the "other" category, Port Cartier with 26.7 million tonnes handled the most cargo.

#### Container Traffic

Table 5-6 looks at the level of container traffic at Canadian ports.

Over the past decade, Vancouver has displaced Halifax as the second largest container port in Canada. The drop in Halifax traffic

TABLE 5-5
TOTAL TONNAGE HANDLED IN CANADA'S PORT SYSTEM
1995 – 1996

	(Thousands of tonnes)		
Port System	1995 Total	1996 Total	% Change
Ports Canada* Harbour Commissions Transport Canada* Other	178,972 43,020 77,199 61,689	180,207 43,487 71,820 62,234	1.0 1.0 -7.0 1.0
Total	360,880	357,748	-1.0

Note: \* Tonnage statistics include cargos shipped across private facilities.

Source: Statistics Canada, Cat. 54-205-XPB

#### TABLE 5-6 CONTAINERS HANDLED AT CANADIAN PORTS 1988 – 1997

(Thousands of tonnes)										
Year	Montreal	Vancouver	Halifax	Other Ports	Total					
1988	5,732	2,732	3,537	468	12,469					
1989	5,365	2,645	3,889	526	12,425					
1990	5,764	2,708	3,909	521	12,902					
1991	5,790	3,290	3,066	448	12,594					
1992	5,781	3,623	2,463	438	12,305					
1993	5,948	3,458	2,519	557	12,482					
1994	7,073	4,246	2,565	549	14,433					
1995	7,142	4,320	3,135	535	15,132					
1996	7,948	5,098	3,178	577	16,801					
1997	8,218	5,937	3,810	640	18,605					
Source:	Canada Ports Corporation									

was due to service adjustments by container lines, such as those serving the Australia trades, who opted to reduce the sailing time for their vessels by dropping Halifax as a port of call and to route Canadian cargo via US ports. Meanwhile, Vancouver has benefited from decisions by most of the major liner operators serving the transpacific to add or maintain calls in Vancouver. In the process, it has regained a portion of the Canadian traffic which was being routed via US west coast ports.

Montreal has continued as the top container port in Canada with much of its traffic moving to and

from Europe. The liner operators serving Montreal continue to rely on US Midwest traffic to supplement their Canadian cargo base

The higher container traffic levels overall for the 1994 – 1996 period reflect the strong performance of the Canadian economy during those years.

Transshipments of Canadian container traffic through US ports amounted to nearly 24 per cent of the total container traffic with Canadian origin or destination in 1995, up slightly from 22.6 per cent of the total in 1994. In tonnage terms, transshipped imports and exports were little changed from

# TABLE 5-7 CANADA'S CONTAINER TRAFFIC TRANS-SHIPPED THROUGH THE US PORT SYSTEM 1989 – 1996

(Thousands of tonnes)										
Year	Exports	% of Total Exports*	Imports	% of Total Imports*	Total					
1989	1,217	23.8	1,125	27.6	2,342					
1990	1,241	20.2	1,076	23.4	2,316					
1991	1,220	18.9	1,124	25.9	2,344					
1992	1,214	17.7	1,059	23.0	2,273					
1993	1,251	19.2	1,209	23.2	2,460					
1994	1,473	19.7	1,375	26.8	2,848					
1995	1,809	20.9	1,480	28.3	3,288					
1996	1,801	N/A	1,389	N/A	3,189					

\* Total traffic = traffic at Canadian ports + Canadian transshipments – US transshipments Source: Journal of Commerce, PIERS Databases.

# TABLE 5-8 US CONTAINER TRAFFIC TRANS-SHIPPED THROUGH CANADA'S PORT SYSTEM 1990 – 1995

(Thousands of tonnes)										
Year	Exports	Imports	Total Traffic							
1990	2,147	1,676	3,823							
1991	2,138	1,578	3,716							
1992	1,742	1,723	3,466							
1993	1,935	2,087	4,022							
1994	2,269	2,697	4,965							
1995	2,394	2,596	4,990							

Source: US Department of Transportation, Maritime Administration (MARAD)

the 1995 levels in 1996. Since 1989, the tonnage of transshipped exports has grown by nearly 50 per cent and the tonnage of imports by 36 per cent. Overall use of US ports by Canadian importers and exporters, however, is not growing in relative terms. Table 5-7 shows Canadian containerized transshipments through US ports from 1989 to 1996.

The major points of entry and exit for Canadian containerized transshipments are New York, Tacoma and Seattle. Approximately 72 per cent of Canadian transshipped imports and 61 per cent of exports, measured in Twenty-Foot Equivalent Units, moved though these US ports in 1996.

More US traffic moved through Canadian ports than Canadian traffic through US ports: 5 million tonnes in 1995 compared with Canada's 3.3 million tonnes. The proportion of total US liner traffic that is transshipped via Canada is much lower, with the percentage declining. In 1989, approximately 5.3 per cent of total US liner traffic moved via Canadian ports. By 1995, this percentage was down to 3.8 per cent. Table 5-8 shows US containerized shipments through Canadian ports.

Most US transshipments move through Eastern Canada on their way to and from Europe. In 1995, such transshipments accounted for nearly 82 per cent of all US transshipments through Canadian ports. Movements through Western Canada account for only a small percentage of US trade.

#### **Financial Performance**

#### Ports Canada

In 1996, Ports Canada posted total revenues of \$235 million, with a net income of \$32 million and operating cash flows of \$102 million. Table 5-9 illustrates 1996 revenues, expenses and some key ratios for Ports Canada ports, and for divisional ports as a whole. In 1996, the seven major ports handled 83 per cent of the volume and generated roughly 75 per cent of the total revenues of Ports Canada ports. Audited financial statements for 1997 were not available.

The overall operating ratio (expenses/revenues) for Ports Canada ports was 75 per cent in 1996. Taken together, the major ports had a ratio of 81 per cent, with individual ratios ranging from 68 to 99 per cent. Except for Vancouver, all were above 83 per cent. For divisional ports, the operating ratio as a whole was 56 per cent.

The return on assets (net income/net fixed assets) for Ports Canada ports was three per cent in 1996. Montreal had the highest return on assets with seven per cent, with its investment income almost as large as its operating income. Taken together, the major ports' return was two per cent, compared

	TABLE 5-9	
FINANCIAL	PROFILE, PORTS CANADA PO	RTS
	1996	

(Millions of dollars)										
Item	Vancouver	Montreal	Halifax	Quebec	Saint John	St. John's	Prince Rupert	Divisiona Ports*	l Total All Ports	
Operating revenues	64.8	56.2	13.2	12.7	13.5	3.1	12.5	59.0	235.0	
Operating expenses	44.3	50.1	10.9	12.6	11.2	2.7	11.4	33.3	176.6	
Operating income	20.5	6.1	2.2	0.1	2.2	0.3	1.1	25.8	58.7	
Ratio: Expenses/Revenues	0.68	0.89	0.83	0.99	0.84	0.89	0.91	0.56	0.75	
Net income	(0.5)	11.8	3.1	0.5	2.1	0.6	0.7	13.2	31.5	
Net fixed assets	427.7	158.7	59.3	51.0	57.9	11.8	94.3	108.1	967.9	
Ratio: Net income/Net fixed assets	(0.00)	0.07	0.05	0.01	0.04	0.05	0.01	0.12	0.03	
Funds from operations	38.6	23.5	5.6	3.4	5.5	1.5	3.2	21.0	102.1	
Investment income	4.2	5.8	0.5	0.5	0.4	0.3	0.8	4.0	16.5	
Total assets	533.7	250.9	74.7	61.9	69.5	17.6	112.3	271.6	1,392.2	
Net capital expenditures	97.4	10.8	5.0	1.5	0.3	0.6	0.4	11.9	128.0	
Retained earnings	210.8	77.4	17.4	0.9	2.3	6.6	16.1	(191.6)	139.8	
Contributed capital	150.3	153.9	50.9	58.2	61.7	10.1	84.6	111.7	681.3	

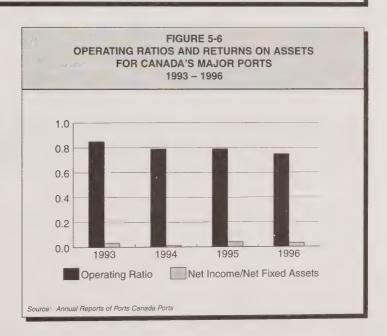
<sup>\*</sup> Ridley Terminals is included in Divisional Ports, yet it is operated independently of Divisional Ports.

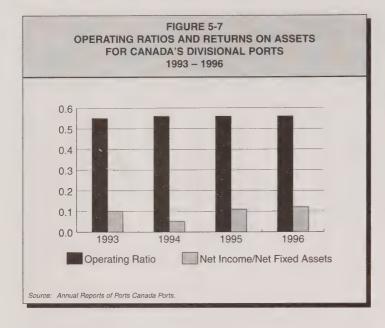
Source: Annual Reports, Corporate Plans

with 12 per cent for divisional ports. Figure 5-6 shows operating ratios and returns on assets for Canada's major ports from 1993 to 1996, while Figure 5-7 shows similar data for divisional ports.

From 1993 to 1996, the financial profile of most ports has consistently improved. Revenues have risen from \$213 million to \$235 million, an increase of 11 per cent. Most of that growth occurred at major ports. Due to lower expenses at major ports, operating costs have either remained steady or declined, moving from \$181 million to \$177 million, a drop of two per cent. As a result, operating income has improved.

Expenses at the divisional ports increased slightly. The overall net effect was that operating income almost doubled, with 1996 major port income more than four times what it was in 1993. Divisional port income remained relatively stable. Table 5-10 shows revenues, expenses and incomes for all Ports Canada ports from 1993 to 1996.





These financial changes occurred as traffic volumes grew more than 11 per cent between 1993 and 1996. Revenue per tonne at \$1.27 in 1996 was down by less than one per cent from 1993. Expenses per tonne dropped from \$1.09 in 1993 to \$0.95 in 1996, a decrease of more than 12 per cent.

#### Harbour Commissions

With the exception of Toronto and Oshawa, all harbour commissions reported positive net incomes in 1996. The Hamilton and Fraser Harbour Commissions posted the largest at just over \$2 million. Total revenues were \$50.9 million and expenses \$49.7 million, creating an operating ratio of 98 per cent. Traffic volume was 43.5 million tonnes, while net income came in at \$4.7 million, providing a return on total assets of 1.4 per cent.

## TABLE 5-10 REVENUES, EXPENSES AND INCOMES OF THE PORTS CANADA SYSTEM 1993 – 1996

(Millions of dollars)

			Оре	Net	Net Income/ Net Fixed						
		Revenues	Expenses	Income	Ratio	Income	Assets				
Major Ports	1993	157.6	150.5	6.9	0.95	18.7	0.02				
	1994	170.7	149.8	20.9	0.88	3.8	0.00				
	1995	169.8	148.3	21.4	0.87	24.3	0.03				
	1996	175.9	143.4	32.9	0.81	18.3	0.02				
Divisional Ports	1993	54.8	30.4	24.5	0.55	10.5	0.10				
	1994	60.8	33.8	27.0	0.56	5.3	0.05				
	1995	60.1	33.9	26.2	0.56	11.3	0.11				
	1996	59.0	33.3	25.8	0.56	13.2	0.12				
Total - All Ports	1993	212.5	180.9	31.3	0.85	29.2	0.03				
	1994	231.5	183.7	47.9	0.79	9.2	0.01				
	1995	229.9	182.3	47.6	0.79	35.6	0.04				
	1996	235.0	176.6	58.7	0.75	31.5	0.03				

Note: With the exception of ratios, the measurement unit is millions of dollars.

Net fixed assets does not include value of projects under construction included in audited statements.

Source: Annual Reports

TABLE 5-11	
FINANCIAL PROFILE OF CANADA'S HARBOUR COMM	MISSIONS
1996	

	(Millions of dollars)									
Item	Port Alberni	Fraser	Hamilton	Nanaimo	North Fraser	Oshawa	Thunder Bay	Toronto	Windsor	Sum of All Commissions
Operating revenues	4.2	8.3	10.3	9.0	4.4	0.4	3.2	9.8	1.3	50.9
Operating expenses	3.9	6.6	8.7	8.8	3.8	0.6	3.2	13.2	1.0	49.7
Operating income	0.3	1.7	1.5	0.2	0.6	-0.2	0.0	-3.4	0.4	1.2
Ratio: Expenses/Revenues	94.0%	79.0%	85.0%	97.5%	86.4%	137.8%	100.0%	134.2%	72.2%	97.6%
Net income	0.5	2.2	2.2	0.4	0.5	-0.6	0.9	-2.0	0.4	4.7
Total assets	15.0	97.0	71.8	34.5	10.4	7.0	25.6	68.0	7.0	336.4
Ratio: Net income/Total assets	3.6%	2.3%	3.1%	1.3%	5.2%	-7.9%	3.5%	-3.0%	6.1%	1.4%
Source: Harbours and Ports Directors	0.270 7.370 0.370 0.170 1.470									

A review of harbour commissions' financial data between 1992 and 1996 shows both revenues and expenses declining during this period. The decline in expenses is more significant. As a result, operating income has almost doubled to \$1.2 million, and the operating ratio (expenses/revenues) has improved. Overall, tonnage handled at harbour commission ports rose by two per cent over the five-year period, with year-to-year fluctuations. Comparing 1996 with 1992, revenues and expenses expressed on a per-tonne basis were about 11 per cent and 15 per cent lower, respectively. Net income more than doubled over the same period.

Table 5-11 details financial results for all harbour commissions.

#### Transport Canada Ports

Of the ports remaining under Transport Canada's control, approximately 12 per cent generated almost three quarters of the total revenues for 1996/97. For this fiscal year, the gross revenues of these facilities were \$20.3 million and expenses were \$28.5 million, leaving an operating revenue shortfall of \$8.2 million. The

#### **TABLE 5-12** FINANCIAL PROFILE OF PORTS REMAINING UNDER TRANSPORT CANADA CONTROL 1996

(Millions of dollars)									
	92/93	93/94	94/95	95/96	96/97				
Revenue <sup>1</sup>	12.3	13.1	12.9	17.1	20.3				
Expenses <sup>2</sup>	31.4	28.5	28.7	33.6	28.5				
Operating income	-19.1	-15.4	-15.8	-16.4	-8.2				
Capital expenditures	16.9	23.8	23.1	11.3	11.9				
Grants & contributions <sup>3</sup>				10.0	13.1				
Ratio: Expenses/Revenues	255%	218%	222%	196%	140%				

1 This represents gross revenues

This represents operating and maintenance expenses including commissions
 This item represents transfers related to the devolution of port facilities

Source: Annual reports, and Transport Canada

overall operating ratio (expenses/ revenues) was 140 per cent. Capital expenditures for the year were roughly \$12 million, and an additional \$13 million came from grants and contributions related to transfers associated with ports divestitures.

Table 5-12 summarizes the financial details of ports and harbours remaining under Transport Canada's control from 1992/93 to 1996/97. Revenues increased by 65 per cent during this time, mostly in the last two years. A combination of growth in traffic and fee increases over the last three years are the primary

reasons for the increases: expenses fluctuated over this period.

Between 1992 and 1996, revenues per tonne rose from \$0.14 to \$0.20, or 38 per cent, while expenses per tonne declined from \$0.37 to \$0.28, or 24 per cent. Capital expenditures dropped by 30 per cent in 1996/97, compared with 1992/93.

#### St. Lawrence Seaway

The St. Lawrence Seaway runs between Lake Erie and the Port of Montreal, and falls under the mandate of the Canadian St. Lawrence Seaway Authority,

TABLE 5-13 ST. LAWRENCE SEAWAY CARGO MOVEMENTS 1990 – 1997							
	(Thousands of tonnes)						
	Montreal-Lake Ontario Section	Welland Canal Section					
1990	36,656	39,398					
1991	34,910	36,919					
1992	31,360	33,174					
1993	31,970	31,815					
1994	38,422	39,703					
1995	38,684	39,376					
1996	38,075	41,145					
1997	36,901	40,898					

which operates eight locks in the Welland Canal and five of the seven locks between Montreal and Lake Ontario. The US Saint Lawrence Seaway Development Corporation operates the remaining two locks in the Montreal–Lake Ontario segment.

Source: St. Lawrence Seaway Authority

#### **Seaway Commercialization**

In July 1996, the Minister of Transport signed a Letter of Intent with the Seaway Users' Group, composed of the system's main users, containing the parameters of a commercialization agreement. Negotiations on remaining aspects of the deal are ongoing, and actual transfer of Seaway operations to a not-for-profit corporation is planned for 1998, dependent on the passage of the proposed *Canada Marine Act*.

Commercialization is vital to the Seaway's future viability. Rationalization and downsizing of heavy industry in the Great Lakes—St. Lawrence Seaway region, as well as the shift of grain markets to the Asia—Pacific area, are making it difficult for the Seaway to remain self-sufficient without revenue increases and cost reductions.

The Users' Group has a transition team working with the federal government to develop the complete management agreement. In addition, the team is working with the Seaway Authority to develop implementation strategies for cost reductions.

#### **Seaway Traffic**

Grain, iron ore, steel products and coal are the main products moved along the Seaway, accounting for over 70 to 80 per cent of cargos on average. There are also important movements of petroleum products, salt and potash, as well as low-value bulk construction materials, such as limestone, cement and gypsum.

The number of vessel transits on the Seaway increased by 3.8 per cent in 1997 to 2,809 on the Montreal – Lake Ontario section and by 2.3 per cent to 3,384 on the Welland Canal section.

Total traffic on the Montreal–Lake Ontario section decreased by 3.1 per cent to 36.9 million tonnes, while traffic on the Welland Canal section decreased by 0.6 per cent to 40.9 million tonnes. Grain shipments increased for both

sections – to 13.5 million tonnes for the Montreal–Lake Ontario section and 13.7 million tonnes for the Welland Canal section, increases of 9.6 and 7.8 per cent, respectively.

Shipments of iron ore decreased to 10.1 million tonnes on the Montreal–Lake Ontario section and 7.9 million tonnes on the Welland Canal section, decreases of 12.7 and 1.2 per cent respectively. Shipments of coal increased by 5.1 per cent to 0.5 million tonnes on the Montreal–Lake Ontario section, as well as on the Welland Canal by 2.4 per cent to 4.6 million tonnes.

Shipments of general cargo – predominantly iron, steel products and slabs – decreased for both sections. On the Montreal–Lake Ontario section, general shipments dropped to 5.1 million tonnes, a decrease of 13.2 per cent, while on the Welland Canal section, general shipments reached 4.1 million tonnes, an increase of 15.1 per cent.

Table 5-13 shows cargo movements on the St. Lawrence Seaway system.

#### **Financial Performance**

Total operating revenues in 1996/97 reached \$83.4 million, an improvement of \$5.3 million over 1995/96. Toll revenues from commercial cargos reached a total of \$75.3 million in 1996/97, an improvement of \$4 million over the previous year. This accounted for 85 per cent of the Seaway Authority's income in 1996/97. Tolls again stayed at the 1993 level.

Operating expenses totaled \$80.1 million in 1996/97, down slightly from their 1995/96 level. The Seaway Authority has been able to contain inflationary cost increases by gradual downsizing, cutting established positions by 243, or 25 per cent, from 1990 to 1996. Operating expenses in 1996/97 were \$53.6 million, down slightly from the previous year's costs of \$53.8 million.

The operating income of \$3.3 million for 1996/97 was an improvement over the loss of \$2.4 million in 1995/96.

Table 5-14 shows the Seaway Authority's financial statistics for the past ten years.

#### Net Income

Examining net income yields a more complete view of annual financial results. This includes investment income, averaging \$5.1 million per year; unusual items, such as claims; and the large corporation tax, averaging \$1.3 million annually since 1989/90.

The net result is an improvement in the financial results at an average of \$5 million a year, while net loss averaged \$2.8 million over the 10-year period. Losses were recorded in each of the first eight years, a large net income of \$15.5 million was reported for 1994/95, and a much smaller net income of \$1.9 million reported for 1995/96.

The net income of \$0.2 million in 1996/97 is to be compared to a net income of \$1.9 million in 1995/96. Some unusual charges of \$7.2 million were incurred in 1996/97 in relation to the dismantling of two railway bridges in the Niagara region and to the upcoming commercialization.

The St. Lawrence Seaway Authority funded all its 1996/97 capital expenditures out of its cash flow and added \$1.9 million to its reserve fund, as Table 5-15 shows.

TABLE 5-14 ST. LAWRENCE SEAWAY FINANCIAL PERFORMANCE 1986/87 – 1996/97

(Millions of dollars)									
	Operating Revenues	Operating Expenditures	Operating Income	Net Income					
1986/87	56.3	65.3	-9.0	-4.4					
1987/88	60.5	70.5	-10.0	-5.5					
1988/89	64.7	72.0	-7.3	-1.9					
1989/90	64.5	75.5	-11.0	-5.1					
1990/91	65.6	80.8	-15.2	-9.9					
1991/92	65.4	76.8	-11.4	-1.8					
1992/93	65.0	78.7	-13.7	-11.0					
1993/94	69.6	78.0	-8.4	-6.1					
1994/95	83.9	74.1	9.9	15.5					
1995/96	78.1	80.6	-2.4	1.9					
1996/97	83.4	80.1	3.3	0.2					

## TABLE 5-15 ST. LAWRENCE SEAWAY AUTHORITY RESERVE FUND 1986/87 – 1996/97

(Millions of dollars)							
Year	Cash provided from Operations	Capital Additions ex govt. funded Rehab.	Welland Canal & Valleyfield Bridge Rehab.	Capital Fund			
1986/87	-1.6	3.5	13.2	17.6			
1987/88	6.8	2.1	24.5	19.9			
1988/89	11.2	0.9	25.4	28.4			
1989/90	6.9	2.4	26.9	31.9			
1990/91	4.0	9.5	27.3	23.9			
1991/92	12.0	14.2	28.7	19.1			
1992/93	-3.9	4.4	37.4	16.1			
1993/94	6.6	7.0		14.8			
1994/95	29.1	8.6		36.3			
1995/96	17.4	8.1		44.7			
1996/97	19.6	11.02		46.6			

Source: St. Lawrence Seaway Authority, Annual Report

TABLE 5-16 PILOTAGE ASSIGNMENTS 1992 – 1997									
Pilotage Authority	Indicators	1992	1993	1994	1995	1996	1997		
Atlantic (APA)	Total Assignments Assignments	9,008	8,867	8,655 188	8,668	8,576 186	9,608		
	per Pilot	100	1//	100	100	100	209		
Laurentian (LPA)	Total Assignments	20,399	19,218	22,550	21,973	21,342	20,941		
	Assignments per Pilot	99	99	122	121	121	120		
Great Lakes (GLPA)	Total Assignments	5,091	5,481	7,787	6,091	6,903	7,192		
	Assignments per Pilot	76	91	148	107	121	114		
Pacific (PPA)	Total Assignments	13,814	12,871	14,053	13,199	13,403	14,212		
	Assignments per Pilot	121	114	128	115	113	121		
Source: Pilotage	Authorities, Annual	Reports							

#### MARINE PILOTAGE

The Pilotage Act of 1972 governs marine pilotage in Canada. The Act established four regional pilotage authorities: Atlantic, Laurentian, Great Lakes and Pacific. Three of the authorities are parent Crown corporations while the Great Lakes Pilotage Authority has been incorporated as a subsidiary of the St. Lawrence Seaway Authority. Notwithstanding this structural anomaly, the Great Lakes Authority is considered a parent Crown corporation for the purposes of the Financial Administration Act. All authorities report directly to the Minister. The authorities are not, however, agents of the Crown.

Each authority has a mandate to provide safe and efficient pilotage services that respond to its particular traffic requirements and the varied geography and climactic conditions of the waterways concerned. To carry out this mandate, the Authorities:

- train and license suitably qualified persons to act as pilots;
- issue pilotage certificates to persons qualified to pilot ships on which they are bona fide crew members;
- · operate pilot boats; and
- enter into negotiated agreements with pilot corporations and unions representing employees of the authorities.

The authorities, with Governorin-Council approval, are permitted to make regulations that:

- establish compulsory pilotage areas;
- prescribe ships, or classes of ships, that are subject to compulsory pilotage and the circumstances under which this requirement may be waived;
- prescribe classes of pilots' licences and pilotage certificates, and the related qualifications and examinations; and

 set tariffs for pilotage charges intended to make the Authority a self-sustaining operation.

### Changes Under Canada Marine Act

In October 1997, the federal government proposed changes to the Pilotage Act as part of the Canada Marine Act. These changes are expected to exert further downward pressure on pilotage costs, while forcing the pilotage authorities to be more financially accountable by denying them access to Parliamentary appropriations and setting limits on the amounts the authorities can borrow. Under the proposed changes, the Minister of Transport will review progress on all major pilotage issues within one year and report back to Parliament.

#### Financial Performance

The number of assignments per pilot for each pilotage authority are shown in Table 5-16. In general, efficiency is holding steady with some improvement noted at three authorities in 1997. In addition, all authorities have improved their bottom line despite fluctuating traffic levels.

In 1997, for the first time in the past 14 years, the pilotage system across the country covered its expenditures. Table 5-17 shows that three of the authorities managed to return modest surpluses, while the Laurentian Pilotage Authority reduced its deficit by more than 60 per cent. In accordance with the December 1995 National Marine Policy, the Laurentian Authority financed its loss through a commercial loan with a financial institution.

#### CANADIAN COAST GUARD

#### Responsibilities

On April 1, 1995, the Department of Fisheries and Oceans took over operation of the Canadian Coast Guard to combine the federal government's two main civilian marine fleets and to create one integrated fleet offering a broad array of ocean programs.

As a result of this merger, the Coast Guard's mandate now includes supporting sustainable ocean management, as well as providing a safe, environmentally sustainable marine transportation system. The Coast Guard now offers marine navigation services; marine communications and traffic services; icebreaking operations; rescue, safety and environmental response activities; and fleet management.

The Coast Guard's clients are well defined, including the Canadian public; the fishing industry; the marine commerce sector, including commercial shipping carriers, ferry operators and the cruise ship industry; the recreational boating sector; Department of Fisheries and Oceans; other government departments; and the international marine community.

### Marine Navigation Services (MNS)

The Marine Navigation group provides, operates and maintains a system of navigational aids to help mariners in determining their position in relation to land and hidden dangers. Its objective is to reduce navigation risk and transit time in support of an environmentally sound transportation system.

The group's navigational infrastructure consists of

# TABLE 5-17 PILOTAGE AUTHORITIES REVENUES AND EXPENDITURES 1997

	(Millions of dollars)								
		Revenues	Expenditures	Surplus/ (deficit)					
APA	1997	9,638	8,618	1,020					
	1996	8,030	7,538	492					
	% change	20.0	14.3	107.3					
LPA	1997	38,185	39,019	(834)					
	1996	36,018	38,846	(2,828)					
	% change	6.0	0.4	70.5					
GLPA	1997	13,120	11,910	1,210					
	1996	12,659	11,644	1,015					
	% change	3.6	2.3	19.2					
PPA	1997	39,802	38,519	1,283					
	1996	36,039	35,859	180					
	% change	10.4	7.4	612.8					
Totals	1997	100,745	98,066	2,679					
	1996	92,746	93,887	(1,141)					
	% charige	8.6	4.5	334.8					
Source: Pilotage Au	uthorities, Annual Repo	orts							

264 automated light stations, 52 of which are staffed; four LORAN C communication stations that operate on a bandwidth used by airports and light stations; over 6,080 land-based fixed marine aids to navigation; and more than 13,640 floating aids.

### Marine Communications and Traffic Services (MCTS)

The Marine Communications and Traffic group ensures the safety at sea of both the marine community and the general public. The group works to uphold international agreements, protect the environment through traffic management, facilitate efficient ship movement, and provide business information.

The group's supporting infrastructure includes staffed communications centres and remote transmitter and receiver sites. Program Review will reduce operational centres from 44 to 22

by the end of 1998/99, integrating facilities wherever possible.

#### Icebreaking Operations (Ice)

Five seasonal ice operation centres provide ice-routing information and route assistance for vessels operating in ice-covered waters in the Arctic, along the East Coast and in the Great Lakes. The centres also support flood-control services in areas prone to flooding or threatened with flooding from ice build-up. In addition, the centres ensure the annual resupply to Northern settlements and military sites.

#### Rescue, Safety and Environmental Response (RSER)

The objective of the Rescue, Safety and Environmental Response group is to save lives and protect the marine environment. The group provides marine search and rescue services and emergency preparedness capabilities. It also

#### **TABLE 5-18** CANADIAN COAST GUARD FLEET AND FACILITIES 1997

CCG Facilities

24 bases and sub-bases

11 helicopter hangars

2 hovercraft facilities

Vessels and Aircraft

120 major ships

307 small craft\*

29 inshore rescue boats

3 air cushion vehicles

29 rotary wing aircraft

2 fixed wing aircraft\*\*

Includes lifeboats, surfboats, self-propelled barges, small craft carried on larger ships, shore-based work boats, floating spill boats, "oil slick-lickers" and other small craft at CCG bases and light stations

\*\* Owned by Transport Canada

Source: Department of Fisheries and Oceans

#### **TABLE 5-19** REVENUES AND BUDGETED EXPENDITURES OF THE CANADIAN COAST GUARD 1997/98

(millions of \$)									
Business line	MNS	MCTS	Ice	RSER	Fleet Mgmt.	CCG Total			
Gross expenditures	159.6	60.2	53.8	137.2	125.6	536.4			
Revenues	27.2	0.7	9.3	0.1	-	37.3			
Net expenditures	132.4	59.5	44.5	137.1	125.6	499.1			
Source: Department of Fisheries and Oceans									

promotes boating safety, and responds to pollution incidents.

The group's supporting infrastructure includes 22 search-and-rescue stations with in-shore rescue boats, 31 regular search-and-rescue stations, and 72 spill-response equipment depots.

#### Fleet Management

The Coast Guard is responsible for managing a large, integrated, multi-tasked fleet that provides efficient sea and air support to several Department of Fisheries and Oceans programs. These programs include fisheries management, hydrography, fisheries and oceans science as well as the four previously mentioned.

This job includes acquiring, maintaining and scheduling the department's vessel and air fleet, and augmenting fleet capabilities when necessary with additional sea and air support from other government departments and the private sector.

Table 5-18 lists the Coast Guard's 1997 vessel, aircraft and facility assets.

#### **Financial Situation** - Canadian Coast Guard

The Coast Guard will permanently reduce its gross operations and maintenance expenditures by \$140 million, or 30 per cent, over the four-year period ending in 1998/99. Cumulative reductions implemented to date amount to \$124 million. Capital funding levels have also been reduced during this period through a combination of temporary cuts to offset revenue shortfalls and a permanent ongoing reduction of \$31 million effective in 1997/98. The Coast Guard has significantly reduced expenditures while delivering the same quality service to a broader client group.

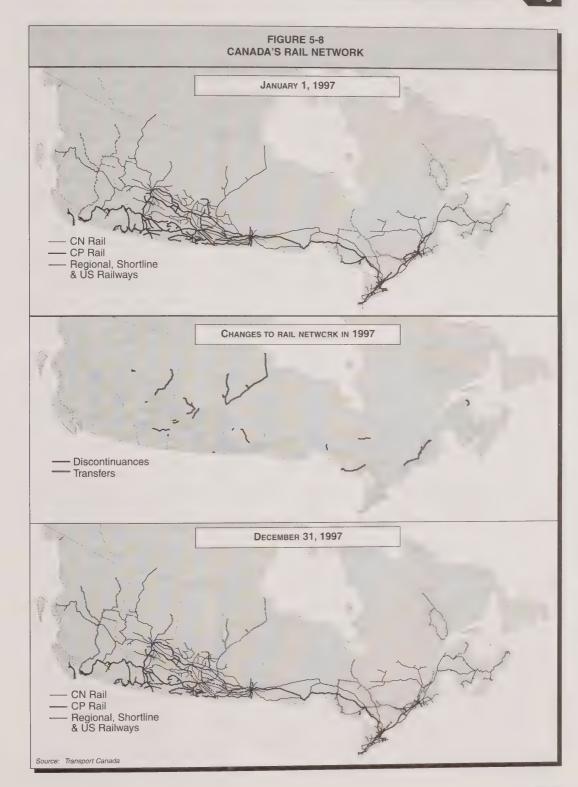
The Coast Guard has implemented user fees for some programs. The objective behind user fees is to obtain a fair contribution from users for programs from which they directly benefit. The first, the Marine Navigation Services Fee, was introduced in June 1996. It offsets, on average, 27 per cent of full costs of providing marine navigational services to the commercial shipping industry.

After industry consultation, a Maintenance Dredging Services Tonnage Fee for the St. Lawrence Ship Channel came into effect in September 1997. The fee is only an interim measure to address the maintenance dredging contracts and management costs until the longerterm issues associated with the transfer of responsibilities to beneficiaries can be resolved.

Table 5-19 lists the Coast Guard's revenues and budgeted expenditures for 1997/98.

#### RAIL TRANSPORTATION Infrastructure

Canadian railways operate approximately 50,000 routekilometres of track across the country, the total trackage owned or otherwise operated under lease, contract or trackage rights. Figure 5-8 shows Canada's rail network.



#### TABLE 5-20 CANADA'S RAILWAY INFRASTRUCTURE 1996 and 1997\*

1990 and 1997	4007	4000
	1997	1996
	Owned – Leased Route-kilometres	Owned – Leased Route-kilometres
Transcontinental	noute-kilottieties	Houte-knornetres
CN Bail	23,731	26,560
CP Rail	15,749	16,724
Sub-total Transcontinental	39,480	43,284
Regional and Shortline		
BC Rail	2,174	2,174
Hudson Bay Railway (OmniTRAX)	1,308	
Ontario Northland	1,074	1,074
Quebec North Shore & Labrador	645	645
RaiLink Ottawa Valley	554	554
Algoma Central (Wisconsin Central) Chemin de fer Québec-Gatineau (Genessee Rail-O	474 ne) 449	474
Carleton Trail (OmniTRAX)	11e) 449 448	
Cartier	426	426
Cape Breton & Central Nova (Railtex)	371	371
RaiLink Lakeland & Waterways	325	
Huron Central (Genessee Rail-One)	296	
Chemin de fer Baie des Chaleurs (Quebec Railway Co	orp.) 237	237
Quebec Southern (Iron Road)	195	195
New Brunswick Southern	195	195
RaiLink Central Western	174	195
Chemin de fer Charlevoix (Quebec Railway Corp.)	147 145	147 145
Greater Winnipeg Water District Canadian American (Iron Road)	110	110
Goderich & Exeter (Railtex)	96	96
Chemin de fer de la Gaspésie	90	30
Windsor & Hantsport (Iron Road)	85	85
Southern Rails Co-operative	68	68
Southern Railway of BC	66	66
Devco	64	64
RaiLink Southern Ontario	63	
Roberval & Saguenay	56	56
L'Orignal (Railtex) Sub-total Regional and Shortline	42 <b>10,376</b>	34 <b>7,512</b>
-	10,370	7,512
Terminal or Switching Arnaud	00	00
Essex Terminal	36 27	36 27
Port Colbourne (Caledonia Hamilton Southern Railwa		21
Wabush	2	2
Sub-total Terminal or Switching	76	65
US Railways		
CSX	97	97
Burlington Northern	105	105
Conrail	87	87
Wisconsin Central	2	2
Sub-total US Railways	290	290
Passenger and Commuter Railways		
GO Transit	14	14
VIA	102	102
Sub-total Passenger and Commuter Railways		116
TOTAL	50,339	51,154

Note: A number of small bridge, tunnel, running rights and subsidiary operations are not shown here. During the past five years, Class I trackage decreased by over 15 per cent, while Class II trackage increased by almost 36 per cent due to the transfer of lines from Class I to Class II railways.

Source: Transport Canada

#### CANADA'S RAIL SYSTEM

The Canadian rail network system continues to be dominated by two Class I freight railways, Canadian National Railways (CN) and Canadian Pacific Railway Company (CP). VIA Rail Canada is also a Class I railway which operates primarily on CN tracks. Class II railways include regional and shortline railways, while Class III railways include terminal railway operations.

CN and CP accounted for about 78 per cent of Canadian rail infrastructure in 1997, measured by route-kilometres. Their share has dropped by almost six per cent in the past year, however, due almost entirely to transfers of some of their lines to new carriers. Consequently, Class II and III railways now operate on over 20 per cent of the Canadian rail system that they own or lease. A few railways operating in Canada do not own trackage, but instead have trackage rights on other railways.

Table 5-20 lists all railways that operated on trackage they owned or leased in Canada during 1997, as well as the route-kilometres of track on which they operated. For comparison, the table also shows the corresponding figures for 1996.

#### Shortlines

Five shortline corporations currently dominate the growing shortline industry in Canada. Three of these, Railtex, Iron Road and OmniTRAX, are headquartered in the US. Another, RaiLink, is based in Alberta, and the last, Genessee Rail-One, is based in Quebec, although largely financed by US-based Genessee Wyoming. These corporations control a growing percentage of Class II operations in Canada, as represented by trackage.

Table 5-21 illustrates the amount of track these five shortline corporations control.

During 1997, the five shortline corporations added approximately 63 per cent, or over 3,000 kilometres, to their total owned or leased trackage. They controlled about 46 per cent of Class II trackage by the end of 1997. Almost all Class I railway trackage transferred during the year involved these five companies.

RaiLink also recently completed a transaction with CN that will see the company acquire over 1,000 kilometres of line in northern Alberta and the Northwest Territories, making it, in aggregate the largest Class II operator in Canada. RaiLink will begin operations over this track in April 1998.

In addition to owning or leasing trackage for its operations, RaiLink has a 25 per cent interest in Quebec Railway Corporation (Société des Chemins de fer du Québec), which currently owns approximately 385 kilometres of track in Quebec.

#### RAIL RATIONALIZATION

Originally synonymous with rail line abandonment, railway rationalization now describes a range of alternatives for track disposal, including sale of track and operations to new or existing carriers; lease of track to other carriers; and service discontinuation.

The overall goals of rationalization are to alter the cost structure of providing rail service. In the case of line transfers to other carriers, usually shortline, the goal is to improve the level of support for shippers by retaining rail service over lines that might

TABLE 5-21
MAJOR SHORTLINE CORPORATIONS OPERATING IN CANADA

Corporation	Owned / Leased Kilometres	Number of Canadian Railways Controlled
Railtex	500	3
Iron Road*	390	3
OmniTRAX	1,780	2
RaiLink	1,280	5
Genessee Rail-One	865	2

\* Note: The Northern Vermont, which is also owned by Iron Road, does not own trackage in Canada, but operates over the trackage of its affiliate, Quebec Southern. Northern Vermont is not included above Source: Transport Canada

тапорот одпаса

## TABLE 5-22 CN AND CP RATIONALIZATION BY PROVINCE 1997

(Route-kilometres)								
		ALTA	SASK	MAN	ONT	QUE	Total	
Discontinuances	CP CN Total	226 41 <b>267</b>	80 7	0 370 <b>370</b>	64 2	165	370 585	
			87		66	165	955	
Transfers	CP CN	0 325	0 448	0 1,308	296 74	350 90	646 2,245	
	Total	325	448	1,308	370	440	2,890	

Note: CP also formed a 263 kilometre internal shortline in B.C.

Source: Transport Canada

otherwise be discontinued. In fact, shortline operators typically increase traffic, revenues and service on the line.

In 1997, a significant increase took place in the number of Class II railways in Canada, as eight new railways with some 2,978 kilometres of track began operations. In contrast, about 2,400 kilometres of track were transferred to 12 operators over the previous 10 years, excluding internal shortlines that remain under CN and CP ownership and operation. Table 5-22 shows the locations of rail line transfers and discontinuances that occurred over the past year.

#### RAIL RATIONALIZATION

The Canada Transportation Act, enacted in 1996, was intended, among other things, to encourage railway financial viability. Recognizing the significant regulatory burden on railways and the pressing need of the industry to restructure, the Act was also intended to facilitate the process of railway rationalization.

Rationalization was to be accomplished while allowing the greatest possible opportunity for line retention through transfer to other operators. For those lines that could not continue operations, the Act specifies a process under which federal, provincial/territorial, and municipal governments are offered lines. Only after all avenues are explored for continued operation are lines discontinued.

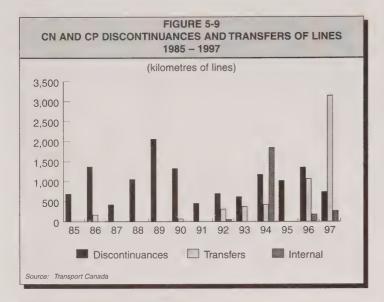


TABLE 5-23 CN AND CP THREE-YEAR RATIONALIZATION PLANS BY PROVINCE									
			(Route	-kilome	tres)*				
		B.C.	Alta	Sask	Man	Ont	Que	N.B.	Total
Discontinue	CP CN Total	0	213 0 213	640 393 1,033	0 60 60	399 451 850	1 3 4	0 0 0	1,253 907 2,160
Transfer	CP CN Total	75 0 75	0 1,029 1,029	407 59 466	112 233 345	136 10 146	81 301 382	13 333 346	823 1,964 2,787
	Net of rationalization to December 31, 1997     Source: Transport Canada								

Figure 5-9 shows the CN and CP rationalization activity from 1985 to 1996. Although they fluctuated considerably, discontinuances were the major method of rationalization during this time. In the early 1990s, however, a number of shortlines were formed, which culminated in an increase in the transfer of lines to shortline operators during the past two years. These changes are a direct result of the new rationalization policy and process

introduced in mid-1996 with the new Canada Transportation Act.

Because the rail network in Western Canada has been protected from abandonment, the focus of past rationalization activity has been in Eastern Canada. This arrangement has changed, however, and the balance of current railway plans includes substantially greater amounts of track to be rationalized in the West.

#### **Transfers**

The greatest number of transfers occurred in Eastern Canada, but the greatest percentage of trackage transferred actually occurred in Western Canada: approximately 67 per cent.

CN accounted for over 70 per cent of the trackage transferred during the past year, although the 1,300 kilometres of line transferred to the Hudson's Bay Railway, which is part of OmniTRAX, was an influencing factor. CN also made the greatest number of transactions, with seven of the nine transfers.

With the sale of almost 570 kilometres of track in Quebec to the Chemin de fer Québec-Gatineau, CP no longer operates east of the Montreal region. The only exception is a very short segment of track in New Brunswick that CP owns but is expected to transfer to Bangor and Aroostook Railroad, a subsidiary of Iron Road Railways.<sup>1</sup>

CN and CP employ a variety of approaches when transferring track to new operators. Both prefer outright sales, although long-term leases are also common.

#### Discontinuances

In 1997, 920 kilometres of track were discontinued, which is a slightly lower figure compared with the more than 1,000 kilometres of track discontinued in each of 1994, 1995 and 1996. These lines were offered to other potential operators and then to governments before discontinuance, as prescribed in the *Canada Transportation Act*. In total, discontinuances accounted for 23 per cent of all track that CN and CP rationalized in 1997.

I Iron Road also owns the Canadian-American Railroad, the Quebec Southern Railway, and the Northern Vermont Railroad, all of which connect directly or indirectly with the Bangor and Aroostook Railroad, which has trackage principally in Maine. Iron Road also owns a completely separate line, the Windsor & Hantsport in Nova Scotia.

#### Rationalization by Province

Provincially, Manitoba dominated rationalization activity during 1997, accounting for approximately 40 per cent of transfers and discontinuances. Again the transfer of 1,300 kilometres of track to OmniTRAX was a significant factor.

Relatively little rationalization activity took place in British Columbia during 1997. CP formed an internal shortline in the province.

Moderate amounts of rationalization took place in Alberta, Saskatchewan, Ontario and Quebec. The activity in these provinces was equal to roughly one third to one half the activity in Manitoba.

#### Internal Shortlines

Because ownership does not change with the creation of internal shortlines, these activities are not included in the rationalization statistics. Mention of their role should be made in the context of restructuring, however, as they represent an alternative to traditional operations with many of the same characteristics as "external" shortlines, such as reduced labour inputs, more flexible labour arrangements, improved revenue generation and a more favourable financial condition in general.

CN operates about 1,900 kilometres of internal shortlines, while CP operates about 510 kilometres. The main portion of CN's internal shortlines makes up the organization's Northern Quebec lines.

#### Railway Three-Year Plans

Under the *Canada Transportation Act*, the railways must each file

publicly a three-year rationalization plan that is updated periodically.

#### Plans by Province

As of the end of 1997, CN and CP plan to transfer about 2,800 kilometres of track and discontinue a further 2,200 kilometres. Table 5-23 shows the proposed line transfers and discontinuances remaining in the current plan.

In western Canada, ongoing grain elevator rationalization over the past several years has had a strong influence on the pace and scope of rail network rationalization. The closure of large numbers of rural elevators in recent years, as well as grain companies' commitments to high-throughput facilities at strategic locations, has driven line rationalization and activities.

Consequently, about 60 per cent of proposed discontinuances and 70 per cent of transfers are slated to take place in Western Canada.

Alberta and Saskatchewan will see the greatest amount of proposed rationalization activity over the next three years. Almost 60 per cent of proposed discontinuances and over 50 per cent of proposed transfers are expected to occur in these two provinces.

About 35 per cent of proposed transfers remaining in the current three-year plans will occur in Alberta. The level of proposed transfer activity should be similar for the remaining provinces.

Of the proposed discontinuances remaining, almost 50 per cent will occur in Saskatchewan, and 40 per cent in Ontario.

#### Trends in Rationalization

If potential transfers and discontinuances continue as outlined, the share of rail lines operated by Class I carriers will shift from its current level of 78 per cent of the total rail network to approximately 71 per cent by the end of the current plan. Transfers proposed in the balance of the current plans are expected to be somewhat greater than discontinuances.

#### CLASS II RAILWAYS

The Class II rail system in Canada includes several large, provincially based, regional carriers and a growing number of smaller shortlines. The system's membership and operating trackage increased by 40 per cent between 1996 and 1997, going from 28 carriers with some 7,900 kilometres to 37 carriers with some 11,000 kilometres.<sup>2</sup>

The operations of these carriers are becoming increasingly varied as well: some perform feeder functions, others perform switch functions, and still others haulage functions. For example, the Caledonia Hamilton Southern performs switching functions in the Welland area; RaiLink Ottawa Valley performs haulage functions for CP (with RaiLink crews simply operating CP trains over the trackage leased by Ottawa Valley); and most other shortlines perform the classic feeder function in conjunction with Class I carriers.

For the most part, transactions between carriers do not involve government support. The sole exceptions were OmniTRAX's acquisition of CN's northern Manitoba lines to Churchill,

<sup>2</sup> These figures do not include railways like the Norfolk Southern (which does not own trackage in Canada, but does have running rights arrangements with CN in southwestern Ontario) and subsidiaries of other railways whose activities were incorporated into those of the parent company.

### TABLE 5-24 CANADA'S ROAD SYSTEM BY PROVINCE OR TERRITORY

	National				
Province/Territory	Total Length	Federal System	Provincial System	Municipal System	Highway System
British Columbia	65,728	2,050	42,279	21,399	5,516.0
Alberta	181,437	3,973	18,292	159,172	3,396.0
Saskatchewan	201,903	3,181	26,200	172,522	2,114.0
Manitoba	87,868	1,740	21,628	64,500	861.7
Ontario	167,891	2,346	28,458	137,087	4,924.4
Quebec	119,878	534	29,344	90,000	2,869.0
New Brunswick	21,883	218	18,480	3,185	954.7
Nova Scotia	25,992	291	23,371	2,330	900.8
P.E.I.	5,686	56	5,128	502	118.0
Newfoundland	13,081	207	8,747	4,127	948.0
Yukon	5,069	94	4,697	278	1,092.0
NWT	5,487	390	4,307	790	562.0
Total	901,903	15,080	230,931	655,892	24,256.6

\* A "two-lane equivalent" is a length of road measured as if there were only two lanes. For example, one kilometre of four-lane highway is the equivalent of two kilometres of two-lane highway. A route-kilometre, on the other hand, is the length of road measured by a vehicle travelling from one end to the other, regardless of the number of lanes over this segment.

Source: Transportation Association of Canada, Transportation in Canada: A Statistical Overview, 1995.

Thompson and Lynn Lake, which involved federal funding through Western Economic Diversification Canada, and the acquisition of a small portion of CN's Chandler subdivision to Gaspé with support from the Quebec Federal Office of Regional Development. Transport Canada did not provide any financial support for these transactions.

## ROAD TRANSPORTATION INFRASTRUCTURE

Canada has over 900 thousand kilometres of roads and highways (referred to collectively as "roads" throughout the report).

Responsibility for roads rests primarily with the provinces and territories.

The federal government has limited involvement in roads. Its responsibility covers four areas of activity: ownership of a small amount of federal infrastructure; financial contributions to other levels of government for highway construction; regulation of international crossings; and research and development.

Municipal governments also have significant responsibility for roads, under various types of arrangements that are specific to each province or territory.

Table 5-24 shows the total length of roads in each province or territory, as well as the amount of road under each jurisdiction.

## RATIONALIZATION AND DEVELOPMENT

A trend has started in recent years for provincial governments to transfer some roads to municipal ownership. On January 1, 1997, Ontario, for example, transferred to municipalities 1,700 kilometres of provincial highways serving primarily local needs. The Ontario government planned to transfer a

further 3,400 kilometres on January 1, 1998, as part of the "Who Does What" review of provincial and local responsibilities.

Bridge design and traffic signals no longer need provincial approval in Ontario, and municipalities have more freedom to manage their own roads. In addition, the province has eliminated the Municipal Roads Funding Program and continued its efforts to outsource construction and maintenance for the provincial highway network through alternative service delivery contracts and other measures.

Ontario has already outsourced the maintenance of 1,200 kilometres in the Chatham area, as well as 100 kilometres around Thunder Bay and 900 kilometres around Sault Ste. Marie. Similarly, Alberta has outsourced the engineering and maintenance of the primary highway system to the private sector.

## MAJOR HIGHWAY PROJECTS

Progress was made across Canada on major highway projects in 1997. The following list summarizes road construction from information provided by provincial governments to the Transportation Association of Canada.

#### Prince Edward Island

The \$840-million, 13-kilometre Confederation Bridge opened to traffic between New Brunswick and Prince Edward Island on June 1, 1997. The structure is the world's longest continuous marine-span bridge over ice-covered water. Strait Crossing Development Inc., a Canadian-French-Dutch consortium, built the bridge and will operate it over the next 35 years. After that, the structure will revert to the Federal Government.

Work was also under way on a \$21.7-million project to widen Charlottetown's Hillsborough Bridge, an important part of the Trans-Canada Highway. In 1997, the bridge piers were modified and the structure's approach roads were widened at a cost of \$13.6 million.

#### Nova Scotia

A new section of Highway 104, the Cobequid Pass, opened for traffic in 1997. The 45-kilometre section of the Trans-Canada Highway is the first segment of toll highway in Atlantic Canada. The \$112-million project is a public-private initiative between the province, Atlantic Highways Corporation and the Newcourt Credit Group.

#### New Brunswick

New Brunswick opened 70.5 kilometres of new four-lane highway in the fall of 1997, as part of a 160-kilometres plus project under way since 1988.

#### Newfoundland and Labrador

The government of Newfoundland and Labrador is in the midst of a 10-year, \$360-million program to upgrade and expand the Trans-Labrador Highway. In 1997, \$20 million was spent on the project's first phase to upgrade the existing road between Churchill Falls and Happy Valley—Goose Bay to a high-standard gravel surface.

#### Quebec

Quebec is twinning Autoroute 55 to link the cities of Sherbrooke and Trois-Rivières. In 1997, 13 kilometres of new lanes parallel to the existing Autoroute 55 between St-François-Xavier-de-Brompton and Windsor were constructed at a cost of \$5.3 million.

#### Ontario

The world's first completely electronic toll highway, Highway 407 ETR (Express Toll Route), opened for traffic in Ontario in 1997. The first 36-kilometre stretch of the highway opened in June north of Toronto, after four years under construction. The remaining 33 kilometres of the \$929.8-million, 69-kilometre toll highway should be open to traffic by the end of 1998. Canadian Highways International Corporation of Mississauga is the builder and operator.

#### Manitoba

Manitoba is upgrading 98 kilometres of its Provincial Trunk Highway 59 to a four-lane, limited-access highway that will connect Winnipeg and the US border. In 1997, new lanes were graded along the first section of the highway to be twinned, and a new bridge was built over the Red River Floodway, all at a cost of approximately \$15 million.

#### Saskatchewan

The Yellowhead Highway (Highway 16) Project involves twinning the 92 kilometres of existing roadway between Saskatoon and the Battlefords, as well as the construction of a new bridge over the North Saskatchewan River. The four-year \$43-million project was completed and opened to traffic in 1997.

#### Alberta

Work continued on a \$91 million project to twin a 97 kilometre stretch of Highway 4 from Coutts to Lethbridge and to open up a continuous four-lane route through Alberta from the US border to Edmonton. The project should be completed by the year 2000.

Work also continued on a \$32 million Parks Canada project to

twin the Trans-Canada Highway from Sunshine to Castle Mountain in Banff National Park. Unique to this project are the various environmental mitigation measures included to protect wildlife.

#### British Columbia

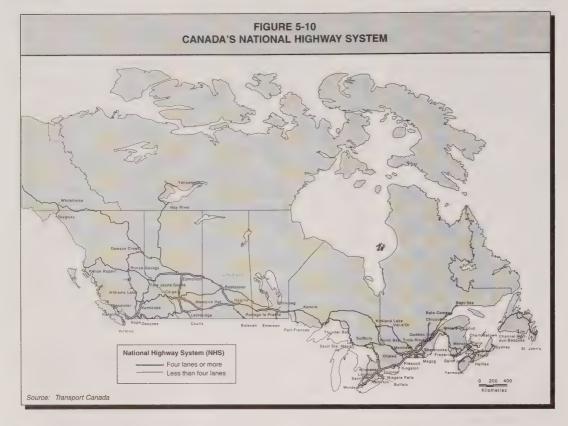
In 1997, work continued on the \$1.2-billion Vancouver Island Highway Project, including improvements to 228 kilometres of highway and the "four-laning" of the Trans-Canada Highway approach to Victoria with five new interchanges and a bypass around Nanaimo. The Nanaimo Parkway and the Duke Point Interchange opened, and the Campbell River bypass and Victoria Trans-Canada Highway approaches were completed.

#### Yukon

In the Yukon, work continued on the Canada-US Shakwak Project, which involves the reconstruction of 520 kilometres of the Haines Road and the Alaska Highway. In 1997, five kilometres of road were reconstructed, 36 kilometres of bituminous surface were treated, and a bridge over the White River was completed. The cost for this work was about \$11 million.

#### Northwest Territories

The Northwest Territories are reconstructing and paving Highways 1 and 3 from Yellowknife to the Alberta border, a 530 kilometre route that carries nearly half of the territory's highway traffic. Since the mid-1980s, construction has moved 410 kilometres northward from the border with Alberta at a cost of \$108 million. In 1997, the NWT Department of Transportation spent \$8.6 million to reconstruct and chip-seal an additional 30 kilometres. The estimated cost to complete the remaining 92 kilometres is \$80 million.



## FEDERAL CONTRIBUTION PROGRAMS

In fiscal year 1997/98, the federal government contributed \$321.6 million to provincial and territorial highway construction, as well as repairs to federally financed structures, such as the CN-owned Victoria Bridge in Montreal.

Among these initiatives are the 1993 – 1999 Strategic Highway/ Transportation Improvement Programs. These include \$845 million earmarked for cost-shared improvement projects across the country, the rehabilitation of the federally owned Jacques-Cartier and Champlain bridges in Montreal, the upgrading of the Trans-Canada Highway through the Banff,

Yoho and Terra Nova national parks, and improvements to the Alaska Highway.

In addition, Highway Improvement Programs (1987 – 1999) are providing more than \$300 million to create a more efficient and effective transportation system in New Brunswick and Nova Scotia, while the Newfoundland Transportation Initiative (1987–2002) is providing more than \$700 million for upgrades to the Trans-Canada Highway and regional trunk roads, following the demise of the Newfoundland Railway.

Also on the East Coast, the Atlantic Freight Transition Program was instituted following the elimination of the *Atlantic*  Region Freight Assistance Act and the Maritime Freight Rates Act. This 1995–2001 program provides \$326 million to the four Atlantic provinces and Quebec for improvements to their freight transportation systems.

Finally, the \$43-million Fixed Link Agreement (1994 – 1999) is assisting Prince Edward Island and New Brunswick as these provinces cope with increased traffic on their highways resulting from the new Confederation Bridge.

#### NATIONAL HIGHWAY SYSTEM

The National Highway System is over 24 thousand kilometres in length. In 1997, 26 per cent of the system was at least a four-lane divided highway, up from 21 per cent in 1988. Figure 5-10 shows Canada's National Highway System.

Table 5-25 shows the estimated costs for upgrading the National Highway System in each province and territory for 1988 and 1997. The table also presents two scenarios for repair.

As the table shows, the overall condition of the National Highway System has not improved. More highway kilometres have capacity problems, and pavement roughness is on the rise. However, the seriousness of the deficiencies, such as the magnitude of pavement rutting and structural deficiencies, and the number of bridges with load restrictions have all been reduced. In general, upgrading costs in Atlantic Canada have become lower than in 1988, while costs for Central and Western Canada have increased significantly.

### Expenditures on National Highway System

While maintenance expenditures have remained relatively constant at about \$300 million per year, capital expenditures have increased steadily to over twice as much as 10 years ago. Table 5-26 examines National Highway System expenditures in each province and territory over the past 10 years.

TABLE 5-25
UPGRADING COSTS FOR THE NATIONAL HIGHWAY SYSTEM
(\$'000)

Province/Territory	Sce 1988 cost estimates	nario A 1997 cost estimates	Scer 1988 cost estimates	nario B 1997 cost estimates	System length (km)
British Columbia	\$ 2,181.8	\$ 2,430.4	\$ 2,852.1	\$ 2,935.8	5.516.0
Alberta	1,991.7	3,030.0	2,049.2	3,239.1	3,396.0
Saskatchewan	608.8	929.3	652.7	929.3	2,114.0
Manitoba	549.5	576.6	565.0	576.6	861.7
Ontario	2,205.3	3,504.7	3,699.4	5,648.2	4,924.4
Quebec	1,330.2	2,763.6	1,749.3	3,388.6	2,869.0
New Brunswick	2,026.3	1,789.6	2,071.4	1,931.4	954.7
Nova Scotia	751.6	537.5	1,122.0	697.6	900.8
P.E.I.	88.8	93.4	186.9	197.6	118.0
Newfoundland	276.5	136.1	1,209.7	1,173.6	948.0
Yukon	394.5	370.1	394.5	370.1	1,092.0
NWT	239.1	253.5	239.1	253.5	562.0
Federal	319.8	278.8	794.6	646.6	562.0
Total	\$12,963.9	\$16,693.6	\$17,585.9	\$21,988.0	24,818.6

Iote: Scenario A consists of expenditures required to upgrade the deficiencies of the system to minimum national engineering standards. Scenario B consists of the total costs of Scenario A with the addition of estimated costs to comolete a continuous four lane route across Canada (largely the Trans-Canada Highway). Currently, almost 40 per cent of it is four lanes or more.

Source: Transportation Association of Canada

#### ROAD USE

### Traffic on the National Highway System

As mentioned before, the National Highway System (NHS), although a small fraction of the total Canadian road network, carries a large proportion of the vehicle traffic. A breakdown of NHS traffic (as measured by the aggregate vehicle-kilometres) by province is shown in Table 5-27.

Traffic is heavily concentrated in the most populous provinces, Ontario and Quebec, which together account for about one-third of the NHS's route-kilometres, but over 60 per cent of the total vehicle-kilometres. The daily average for these provinces was nearly 16,000 vehicles per day in 1993, much higher than any other province. Traffic growth since 1986 was also highest in these two provinces, with Quebec's traffic

growing the fastest of all, averaging over four per cent compound growth during the period. Outside of central Canada, no province had a traffic share greater than its share of the network. This is due to the fact that settlement patterns in Central Canada are very dense. particularly along the Great Lakes and St. Lawrence River. The close proximity of many large urban areas in Ontario and Ouebec and the integration of economic activity and social interaction in these provinces are conducive to the generation of large traffic volumes. This is illustrated in Figure 5-11 which maps the daily vehicle traffic volumes. Traffic clusters around the largest urban centres, especially Toronto, Montreal, and Vancouver, and is distributed heavily along a few discrete highway corridors. It is important to note that road traffic is predominantly short-haul, with most car and truck trips well under 200 km in one-way length.

TABLE 5-26 NATIONAL HIGHWAY SYSTEM SPENDING ESTIMATES 1987/88 – 1996/97
Capital Expenditures (Millions of dollars)

		Capi	tal Expend	litures (Mil	lions of do	ollars)				
	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97
British Columbia	134.0	53.0	101.0	166.0	169.0	92.1	131.5	197.5	208.3	271.6
Alberta	117.8	102.5	89.8	91.2	72.5	67.4	76.0	72.0	100.0	89.0
Saskatchewan	16.6	27.1	28.1	25.8	12.3	10.1	26.4	23.6	18.1	10.9
Manitoba	16.3	17.5	23.4	30.0	24.5	24.8	33.5	26.2	18.9	11.1
Ontario	149.6	152.8	130.2	228.9	266.9	263.7	305.1	371.6	324.0	508.7
Quebec `	65.9	64.8	85.1	150.6	139.1	148.1	225.4	212.7	184.5	182.1
New Brunswick	20.5	18.1	30.0	57.0	58.0	46.7	86.1	72.9	134.9	147.1
Nova Scotia	1.3	16.6	25.7	39.0	46.6	46.7	42.0	41.8	35.6	46.7
Prince Edward Island	1.5	2.2	0.9	2.9	7.9	6.7	5.4	3.2	4.7	4.6
Newfoundland	25.2	22.2	25.9	36.4	33.4	34.8	35.0	35.0	35.0	30.0
Yukon	5.3	7.0	9.7	12.6	7.1	13.9	25.3	41.8	44.5	36.9
Northwest Territories	3.2	3.4	8.1	10.1	18.6	16.7	13.6	15.4	13.3	13.1
Total	557.2	487.2	557.9	850.5	855.9	771.7	1,005.3	1,113.7	1,121.8	1,351.8
		Mainte	nance Exp	enditures	(Millions o	f dollars)				
	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97
British Columbia	58.1	63.2	68.0	74.0	79.0	74.6	78.2	79.5	81.6	83.2
Alberta	33.5	25.0	22.5	23.2	23.3	24.0	24.0	24.0	25.0	25.0
Saskatchewan	11.1	12.0	13.2	13.0	13.0	8.1	6.1	5.4	6.3	6.9
Manitoba	6.5	7.2	7.8	8.2	8.4	8.6	7.8	7.7	7.6	6.8
Ontario	80.2	85.0	89.7	94.4	99.0	98.4	78.1	74.0	77.2	77.5
Quebec	46.4	48.0	50.0	52.0	54.0	55.0	117.0	115.3	114.8	113.6
New Brunswick	11.5	11.0	11.7	12.0	10.9	10.4	10.3	10.6	10.8	11.2
Nova Scotia	16.8	8.9	9.8	9.4	9.2	10.4	13.4	13.3	19.5	12.4
Prince Edward Island	0.7	0.7	8.0	0.8	0.8	0.8	0.8	0.9	0.9	1.6
Newfoundland	9.1	8.7	8.6	8.9	9.3	9.3	10.3	10.3	10.3	10.3
Yukon	10.6	13.8	13.1	15.0	15.7	13.3	9.3	9.6	9.6	9.1
Northwest Territories	3.4	3.9	4.4	4.0	3.3	4.2	3.9	4.9	4.7	4.6
Total	287.9	287.4	299.6	314.9	325.9	317.1	359.2	355.5	368.3	362.2
Source: Transportation Association	n of Canada									

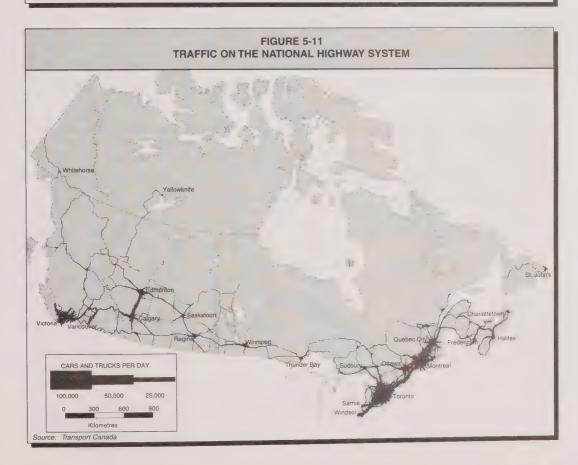
The busiest corridor of all is the Highway 401 – Highway 20 corridor running from Quebec City to Windsor. Traffic levels routinely average over 30,000 vehicles per day, but rise significantly as one approaches Toronto and Montreal. Traffic through the Montreal core exceeds 150,000 vehicles per day, while traffic through the Toronto area is busiest of all, exceeding 350,000 vehicles per day.

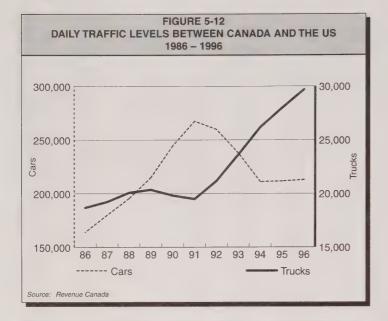
The busiest corridor outside Central Canada, is the Trans-Canada Highway in the lower mainland of B.C., running from Chilliwack to Vancouver. Traffic exceeds 50,000 vehicles per day over many sections of this road and exceeds 100,000 per day as one enters the Greater Vancouver area. The next busiest corridor is Highway 2, running between Calgary and Edmonton. Traffic levels average almost 15,000 vehicles per day over this 300-km stretch of highway. The busiest corridor in Atlantic Canada is the stretch along Highway 102 between Truro and Halifax, N.S. Average daily traffic volumes exceed 15,000 vehicles over most sections of this highway.

TABLE 5-27
DAILY TRAFFIC LEVELS ON THE NATIONAL HIGHWAY SYSTEM

Province/	1993 Route- kilometres	kiloi (bil	hicle- netres lions)	Average annual growth in	annua	rage al daily (AADT)		Percentage distribution Vehic	le-km
territory	(000s)	1993	1986	veh-km	1993	1986	km	1993	1986
Newfoundland	0.9	0.8	0.7	1.4%	2,400	2,100	3.6	1.0	1.2
Prince Edward Island	0.1	0.2	0.1	3.2%	4,200	3,300	0.5	0.2	0.2
Nova Scotia	0.9	2.2	1.8	3.1%	7,100	5,700	3.6	3.0	3.1
New Brunswick	0.9	2.2	2.0	1.4%	6,400	5,800	4.0	3.0	3.4
Quebec	2.8	18.5	13.9	4.1%	18,000	13,600	11.7	25.2	23.8
Ontario	5.0	27.1	21.5	3.3%	14,800	11,800	20.9	36.9	36.8
Manitoba	0.9	1.3	1.2	1.8%	4,300	3,800	3.6	1.8	2.0
Saskatchewan	2.1	2.8	2.4	2.4%	3,700	3,100	8.8	3.8	4.1
Alberta	3.5	7.6	6.3	2.8%	5,900	4,900	14.7	10.4	10.7
British Columbia	5.3	10.5	8.3	3.3%	5,400	4,300	22.3	14.2	14.3
Yukon	1.0	0.2	0.2	1.5%	600	500	4.1	0.3	0.3
Northwest Territories	0.6	0.04	0.04	0.3%	200	200	2.3	0.1	0.1
Total	24.0	73.5	58.5	3.3%	8,400	6,700	100.0	100.0	100.0

Source: Traffic Statistics: Provincial Highways Departments; Other: Transport Canada calculations





**TABLE 5-28** 

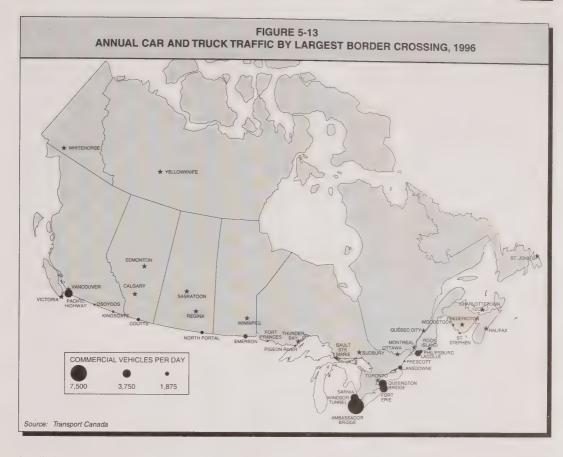
ANNUAL CAR AND TRUCK TRAFFIC FOR MAJOR BORDER CROSSINGS 1996									
Crossing	Province	Total Annual Traffic (mill.)	Share %						
Ambassador Bridge	Ontario	10.3	12						
Pacific Highway	B.C.	8.9	10						
Windsor Tunnel	Ontario	8.9	10						
Fort Erie	Ontario	7.6	9						
Sarnia	Ontario	4.9	6						
Queenston Bridge	Ontario	4.6	5						
Rainbow Bridge	Ontario	3.2	4						
Sault Ste. Marie	Ontario	3.0	3						
Lacolle	Quebec	2.9	3						
Huntingdon	B.C.	2.4	3						
Boundary Bay	B.C.	2.1	2 2 2						
Cornwall	Ontario	2.0	2						
St. Stephen	New Brunswick	1.9							
Edmundston	New Brunswick	1.7	2						
Aldergrove	B.C.	1.6	2 2 2						
Lansdowne	Ontario	1.6	2						
Rock Island	Quebec	1.5	2						
Whirlpool Bridge	Ontario	1.3	1						
Philipsburg	Quebec	1.0	1						
Fort Frances	Ontario	1.0	1						
Sub-total		72.5	82						
Total		88.5							
Source: Revenue Canada									

### Traffic between Canada and the United States

Although traffic on the NHS has grown at an average annual rate of 3.3 per cent between 1986 and 1993, traffic growth between Canada and the US has been even stronger averaging over 4.5 per cent per annum. As Figure 5-12 shows, the two-way movements across the border have fluctuated dramatically since the late-1980s. This was especially true of passenger car movements which grew by over 60 per cent between 1986 and 1991, from about 165,000 vehicles per day to nearly 270,000 vehicles per day. This huge growth in traffic was largely in response to the substantial appreciation of the Canadian dollar (to about US90¢), which made American-made goods relatively cheaper and spawned a massive cross-border shopping spree. With the recession of the early 1990s and the decline of the Canadian dollar, passenger car traffic fell dramatically by over 20 per cent by 1994 and has since stabilized at an average of about 210,000 vehicles per day.

Cross-border truck flows have been particularly strong during the 1990s. Between 1986 and 1991, truck traffic grew by less than five per cent from a daily average of 18,700 vehicles to 19,500 vehicles. Since 1991, though, growth has skyrocketed, leaping by over 50 per cent by 1996 to nearly 30,000 vehicles per day. Much of this increase can be attributed to the closer integration of the North American economy brought on by the signing of the North American Free Trade Agreement (NAFTA) in 1991.

The spatial distribution of crossborder traffic is heavily skewed to a small number of sites. In 1996, about 120 border crossings



handled at least some traffic, but over 80 per cent of the total car and truck traffic passed through just 20 sites. As Table 5-28 shows, eleven of the largest sites were located in Ontario, four were located in B.C., three were located in Ouebec and the balance in New Brunswick. Almost all sites were located either along a major traffic corridor (e.g., the Windsor-area crossings, the Niagara region crossings, or the Pacific Highway) or in a city in close proximity to the US border (e.g., Cornwall, Edmundston) and thus a generator of cross-border shopping activity.

Table 5-28 and Figure 5-13 indicate the principal commercial vehicle border crossings which handle significant truck flows and

which offer 24-hour-a-day customs facilities (so-called Designated Commercial Offices (DCO). The Windsor-area crossings were the busiest in Canada, handling nearly 7,500 heavy vehicles per day (2.7 million per year) in 1996. A further 3,000 trucks per day crossed at nearby Sarnia. The second busiest area was the Niagara region, which together handled over 6,000 trucks per day. The Pacific Highway crossing in B.C. was third largest, handling over 2,000 heavy vehicles per day. The largest commercial vehicle crossing in Quebec was the crossing at Lacolle near Autoroute 15. It handled 1,700 trucks per day in 1996.

Over 80 per cent of Canadian trade transported by road to and from the US or Mexico clears customs at one of Canada's 10 busiest border crossings. This trade is worth more than \$200 billion annually.

The busiest border crossings have experienced double-digit growth rates in Canadian road trade over the period 1988 – 1996. The increase in the value of our road exports at the more than 100 remaining border crossings has been much more modest at slightly higher than two per cent a year over the same period.

#### **TECHNOLOGY**

A conceptual design for an Intelligent Transportation Border Crossing System is being tested at both the Canada - US and US - Mexico borders by the customs administration and transportation and immigration departments of the three countries. The Canada - US tests are being conducted at the Peace Bridge, between Ontario and New York, and the Ambassador Bridge, between Ontario and Michigan.

With 70 per cent of Canada's \$1-billion-a-day trade with the US travelling by truck, intelligent transportation system technology could improve traffic flow, particularly for commercial vehicles. Such systems could, among other things, allow Customs and Immigration pre-clearance, and facilitate vehicle and driver inspection.

The International Standards Organization (ISO) has set up a technical committee to develop global standards for intelligent transportation systems and road telematics.

ANNEX 5-1 TOTAL AIRCRAFT MOVEMENTS 1991 - 1997								
National Airports	1991	1992	1993	1994	1995	1996	1997	% Change 96/95
Calgary International	208,647	205,228	202,247	206,227	225,150	235,167	238,940	1.6
Charlottetown	29,302	26,287	31,152	24,565	23,709	24,472	22,024	-10.0
Edmonton International	69,289	66,168	56,248	59,292	65,821	90,804	107,362	18.2
Edmonton Municipal	124,038	118,564	116,063	111,371	102,881	84,448	78,816	-6.7
Fredericton	37,647	43,091	49,819	45,083	36,113	30,410	27,933	-8.1
Gander International	39,835	42,067	41,387	45,420	49,765	49,862	· ·	6.3
Halifax International	111,950	112,148	111,002	119,561	136,661	139,093	167,567	20.5
Kelowna	58,632	64,401	54,370	61,399	52,263	60,723	73,779	21.5
Lester B Pearson Int'l	322,278	327,526	305,352	307,023	341,976	372,418	395,755	6.3
London	108,239	103,761	95,746	98,704	104,790	106,642	107,135	0.5
Moncton	75,532	69,423	62,745	68,051	78,236	73,750	79,670	8.0
Montreal/Dorval Int'l	197,463	197,464	188,773	191,808	198,252	202,220	195,043	-3.5
Montreal/Mirabel Int'l	61,721	56,706	50,517	53,788	56,780	55,800	50,688	-9.2
Ottawa International	162,758	157,482	146,616	144,721	161,023	163,697	169,290	3.4
Prince George	56,464	51,425	54,380	58,607	59,692	58,262	62,451	7.2
Quebec	141,071	125,730	131,422	127,812	130,308	132,572	125,285	-5.5
Regina	81,440	75,838	72,196	67,265	62,658	66,745	69,773	4.5
Saint John	32,291	34,330	35,717	33,344	31,374	32,426	32,221	-0.6
Saskatoon	95,354	96,115	82,007	88,648	86,026	91,258	107,190	17.5
St. John's	68,272	63,692	59,307	58,502	58,583	62,607	75,711	20.9
Sudbury	107,179	96,476	70,597	69,201	72,273	62,225	60,548	-2.7
Thunder Bay	107,896	117,138	94,562	82,611	82,527	100,161	80,905	-19.2
Vancouver International	288,106	289,904	289,093	301,163	311,450	329,960	342,552	3.8
Victoria International	187,619	186,293	165,643	163,770	163,474	159,781	174,513	9.2
Whitehorse	39,707	45,794	45,714	51,496	50,933	42,575	40,197	-5.6
Winnipeg International	140,105	139,860	139,012	154,868	156,002	155,065	155,193	0.1
Yellowknife	46,719	56,376	71,914	83,281	65,340	62,881	55,058	-12.4
Total NAS	2,999,554	2,969,287	2,823,601	2,877,581	2,964,060	3,046,024	3,148,620	3.4

Source: Aircraft Movement Statistics, TP 577

ANNEX 5-2 ENPLANED AND DEPLANED PASSENGERS							
National Airports	1991	1992	1993	1994	1995	1996	% Chang 96/95
Calgary International	4,573,759	4,695,680	4,590,786	4,746,849	5,291,063	6,662,242	25.9
Charlottetown	178,700	192,085	171,905	174,688	178,902	185,561	3.7
Edmonton International	1,810,020	1,790,618	1,521,078	1,508,093	1,776,639	2,896,578	63.0
Edmonton Municipal	922,589	871,943	1,001,582	971,367	791,447	388,009	(51.0)
Fredericton	195,621	213,323	188,177	187,299	193,376	199,278	3.1
Gander International	100,754	100,968	92,472	97,657	93,137	78,192	(16.0)
Halifax International	2,292,429	2,310,146	2,253,156	2,258,581	2,338,364	2,462,256	5.3
Kelowna	302,143	297,609	286,167	293,026	317,330	539,352	70.0
Lester B Pearson Int'l	18,494,707	19,124,040	19,282,084	19,555,520	20,909,173	22,669,189	8.4
London	234,396	257,888	264,017	273,842	317,336	323,709	2.0
Moncton	220,840	230,303	222,418	220,587	223,667	221,629	(0.9)
Montreal/Dorval Intl	5,590,476	5,564,330	5,592,960	5,568,278	5,728,508	6,142,204	7.2
Montreal/Mirabel Intl	2,255,323	2,427,947	2,259,007	2,299,476	2,375,956	2,391,594	0.7
Ottawa International	2,420,548	2,497,673	2,377,324	2,344,035	2,458,162	2,763,420	12.4
Prince George	234,815	234,945	232,748	248,328	241,897	254,519	5.2
Quebec	684,377	679,785	662,128	602,210	652,915	640,304	(1.9)
Regina	556,549	578,917	507,260	494,246	534,372	639,512	19.7
Saint John	197,320	196,052	183,274	183,058	191,778	189,907	(1.0)
Saskatoon	562,423	571,286	504,263	493,081	545,798	632,968	16.0
St. John's	613,277	622,507	597,292	627,465	624,096	625,687	0.3
Sudbury	220,773	207,253	189,607	180,627	191,281	180,778	(5.5)
Thunder Bay	505,740	494,553	457,950	432,456	456,867	472,821	3.5
Vancouver International	8,996,196	9,449,939	9,678,953	10,205,784	11,107,284	13,090,057	17.9
Victoria International	666,543	697,478	662,625	696,490	726,873	879,367	21.0
Whitehorse	110,283	122,380	105,795	111,021	122,476	145,330	18.7
Winnipeg International	2,072,674	2,142,124	2,081,464	2,148,890	2,299,005	2,830,044	23.1
Yellowknife	197,372	191,042	198,988	192,498	217,169	213,287	(1.8)
Total NAS Airports	55,210,647	56,742,814	56,165,480	57,115,452	60,904,871	68,717,794	12.8

### ANNEX 5-3 ENPLANED AND DEPLANED CARGO

			(Kilogram	s)			
National Airports	1991	1992	1993	1994	1995	1996	% Change 96/95
Calgary International	41,500,983	41,736,814	42,668,125	46,352,376	43,970,020	53,556,534	21.8
Charlottetown	210,198	116,322	111,159	151,280	82,597	76,162	(7.8)
Edmonton International	22,480,629	18,128,753	18,482,074	14,074,233	12,572,392	13,156,177	4.6
Edmonton Municipal	703,554	616,760	1,127,322	3,075,845	2,613,234	1,286,873	(50.8)
Fredericton	136,559	138,213	111,751	96,004	49,827	48,707	(2.2)
Gander International	95,592	172,843	240,977	52,000	140,580	241,850	72.0
Halifax International	25,598,082	21,545,518	18,898,584	18,097,918	20,129,025	17,926,385	(10.9)
Kelowna	6,062	-	-	415,282	700,939	724,107	3.3
Lester B Pearson Int'l	311,892,446	297,583,151	312,056,546	307,041,276	320,273,947	336,654,076	5.1
London	93,600	283,100	31,459	377,000	100,500	167,400	66.6
Moncton	6,080,386	4,304,521	4,778,069	1,731,331	798,858	486,375	(39.1)
Montreal/Dorval Intl	26,364,274	25,963,991	27,092,880	27,316,461	24,907,747	23,744,418	(4.7)
Montreal/Mirabel Intl	85,823,749	87,807,390	88,132,818	81,474,917	81,460,344	82,064,607	0.7
Ottawa International	7,198,851	6,706,015	5,802,464	7,153,909	6,024,249	4,890,115	(18.8)
Prince George	304,488	260,962	403,732	488,547	452,716	311,110	(31.3)
Quebec	425,071	394,644	207,067	184,793	171,953	97,091	(43.5)
Regina	1,946,882	1,089,613	778,248	1,516,782	1,833,706	1,966,251	7.2
Saint John	256,845	164,666	147,247	228,893	112,486	90,699	(19.4)
Saskatoon	1,067,227	783,104	796,922	1,703,890	2,053,566	2,380,833	15.9
St. John's	4,674,702	4,189,531	4,546,963	5,081,383	5,001,095	1,964,027	(60.7)
Sudbury	1,341	-			-		
Thunder Bay	786,686	703,251	673,800	845,509	850,610	506,748	(40.4)
Vancouver International	124,190,462	131,134,676	142,535,227	160,666,918	166,943,688	190,814,043	14.3
Victoria International	102,065	110,026	109,634	420,379	695,601	851,500	22.4
Whitehorse	831,768	812,735	731,085	739,176	825,946	860,856	4.2
Winnipeg International	25,543,287	28,406,951	29,680,145	19,733,467	14,884,851	12,112,518	(18.6)
Yellowknife	1,942,467	1,871,990	1,651,869	2,320,543	2,257,338	2,142,595	(5.1)
Total NAS Airports	690,258,256	675,025,540	701,796,167	701,340,112	709,907,815	749,122,057	5.5

Source: Statistics Canada, Statements 2 and 6

	ANNEX 5-4 AIRPORTS CAPITAL ASSISTANCE PI PROJECTS APPROVED IN 19:			
Site	Description		Funded	T.E.C. (\$000)
New-Brunswick			28.02.97	426.1
St. Leonard Miramichi	Mobile equipment Various airport improvements		08.07.97	3,801.3
Bathurst	Purchase & install electronic door		08.07.97	25.0
Charlo	Resurface runway, taxiway and apron	Sub-total	14.11.97	2,015.8 <b>6,268.2</b>
Québec		Oub total		·
La Grande Rivière	Rehab, maneuvering surfaces & visual aids		16.04.97 16.04.97	2,880.1 1,844.7
Chisasibi Alma	Rehab. runway, lighting & related works Rehab. drainage, machinery & roadway		04.07.97	996.3
		Sub-total		5,721.1
Ontario Wawa	Rehab. runway, taxiway, apron and lighting		12.03.97	3,149.5
Sioux Lookout	Mobile equipment		02.04.97	401.1
Geraldton	Mobile equipment		12.03.97	387.7
Nakina	Mobile equipment		02.04.97	262.8
Fort Frances Marathon	Lighting rehab. / approach path indicator  Mobile equipment		08.04.97 03.07.97	296.1 394.0
Elliot Lake	Mobile equipment		03.07.97	407.0
Kirkland Lake	Mobile equipment		03.07.97	407.0
Wawa	Mobile equipment		03.07.97	388.0
Manitouwadge	Mobile equipment		27.08.97	411.0 411.0
Cochrane Pelee Island	Mobile equipment Mobile equipment		13.08.97 03.07.97	231.0
Kingston	Mobile equipment		03.07.97	561.0
Hornepayne	Air terminal building renovations		03.07.97	7.5
Hamilton	Runway/taxiway restoration		17.07.97	2,883.9
Hamilton Chapleau	Mobile equipment Mobile equipment		03.07.97 14.07.97	14.0 374.8
Fort Frances	Mobile equipment		14.07.97	167.0
Dryden	Mobile equipment		21.07.97	154.0
Sarnia	Mobile equipment		29.09.97	152.0
Hamilton	Approach path indicator installation		06.10.97	83.2
Hamilton	Apron reconfiguration	Sub-total	24.10.97	4,904.2 <b>16,447.8</b>
Manitoba	A A - In the control of the control		00.07.07	200.0
Pine Dock Gillam	Mobile equipment  Mobile equipment		28.07.97 28.07.97	686.0 421.0
Dauphin	Overlay runway, taxiway and apron		08.07.97	2,645.0
Swan River	Replace rotating beacon		11.02.97	9.4
Saskatchewan		Sub-total		3,761.4
Wollaston Lake	Rehab. edge lighting, new approach path indi	icator,		
	Wind sock		19.06.97	218.4
Stony Rapids Prince Albert	Approach path indicator		19.06.97	171.0
Prince Albert	Rehabilitate airfield lighting	Sub-total	28.02.97	1,009.8 <b>1,399.2</b>
Alberta	Books to the later			·
Medicine Hat Peace River	Restore taxis, visual aids, snowblower Rehabilitate runway and taxiways		17.06.97	1,275.7
High Level	Wildlife management fence		18.06.97 25.07.97	864.4 157.7
Grande Prairie	Air terminal building roof rehabilitation		10.10.97	58.5
	3	Sub-total		2,356.3
British-Columbia Nanaimo	Payament robots		04.00.07	10110
Campbell River	Pavement rehab. – overlay runway and taxis Replace security gates		04.06.97 18.06.97	1,641.2 12.0
Dawson Creek	Mobile equipment		16.10.97	160.3
Quesnel	Resurface pavement/airfield lighting improven	ment	16.02.97	1,857.5
Nanaimo	Gate replacement and decelerometer		14.11.97	18.8
		Sub-total		3,689.8
T.E.C. = Total estimated cost		TOTAL		39,643.8
Source: Transport Canada				

Ports Canada ports	1995 Total	1996 Total	% Chang
Local Ports Corporation			7
Vancouver	69,440,822	71,405,265	3
Saint John	18,739,117	20,574,831	10
Montréal	18,603,596	19,207,872	3
Québec	17,386,413	16,986,969	-2
Halifax	13,353,421	13,587,006	2
Prince Rupert	11,366,897	9,451,141	-17
St. John's	842,519	814,093	-3
Divisional Ports			
Sept-Îles	23,152,515	22,583,930	-2
Trois-Rivières	2,614,235	2,184,201	-16
Belledune	1,452,230	1,388,874	-4
Port Colborne	780,535	992,379	27
Prescott	548,588	441,095	-20
Port Saguenay/Baie des Ha!Ha!*	452,251	284,374	-37
Churchill**	239,302	304,750	27
Total	178,733,139	180,206,780	1

ANNEX 5-5b PERCENTAGE CHANGE IN TOTAL TONNAGE HANDLED BY HARBOUR COMMISSIONS								
Harbour Commissions ports	1995 Total	1996 Total	% Change					
Hamilton	11,928,731	12,756,879	7					
Thunder Bay	11,499,559	10,100,099	-12					
Fraser River*	7,303,138	7,526,313	3					
Windsor	4,630,119	5,079,349	10					
North Fraser	3,289,001	3,814,929	16					
Nanaimo	2,568,814	2,070,062	-19					
Toronto	1,048,251	1,428,808	36					
Port Alberni	670,219	614,914	-8					
Oshawa	82,308	95,518	16					
Total	43,020,140	43,486,871	1					
Note: Tonnage statistics include cargos shipped across * includes New Westminster	private facilities.							
Source: Statistics Canada, Cat. 54-205-XPB								

Source: Statistics Canada, Cat. 54-205-XPB

ANNEX 5-5c
PERCENTAGE CHANGE IN TOTAL TONNAGE HANDLED BY
TRANSPORT CANADA AND OTHER PORTS

	1995 Total	1996 Total	% Change
Transport Canada ports			
Port Hawkesbury	11,890,623	7,884,561	-34
Baie-Comeau	7,552,242	5,866,556	-22
Come By Chance 1	6,108,121	7,430,453	22
Nanticoke 1	5,608,661	6,789,838	21
Sorel	5,594,775	5,579,475	0
Havre-Saint-Pierre	2,873,628	2,833,693	-1
Kitimat 1	2,763,253	2,464,226	-11
Goderich	2,759,640	3,943,037	43
Sarnia	2,537,987	2,214,798	-13
Crofton	2,352,813	2,066,687	-12
Hantsport	1,648,088	1,514,400	-8
Blubber Bay	1,528,735	1,613,858	6
Dalhousie	1,462,207	1,252,342	-14
Squamish	1,136,638	1,000,471	-12
Victoria and Esquimalt	1,103,347	1,499,461	36
Total	56,920,758	53,953,856	-5
Other ports			
Port Cartier	24,911,581	21,729.367	-13
Howe Sound	5,329,557	4,864,546	-9
East Coast Vancouver	4,131,102	4,061,566	-2
Port Alfred	3,295,270	3,719,646	13
Meldrum Bay	2,254,749	2,823,508	25
Clarkson	1,523,548	2,389,072	57
Courtright	1,884,951	2,138,823	13
Colborne	1,086,657	1,823,570	68
Bécancour	1,274,787	1,472,413	16
Picton ·	1,223,282	1,252,433	2
Texada Island	1,231,986	1,236,437	0
Jervis Inlet	725,647	1,140,982	57
Bowmanville	1,175,245	1,137,720	-3
Cohasset	726,641	1,058,686	46
Total	50,775,003	50,848,769	0

Notes: Tonnage statistics include cargos shipped across private facilities.

Source: Statistics Canada, Cat. 54-205-XPB.

The port is a declared public harbour under the control and administration of Transport Canada, Harbours and Ports.
 All facilities at the port are privately owned and operated.

## TRANSPORTATION SAFETY

Transportation safety in Canada continued to improve, accident and number of fatalities having declined generally in all modes.

In Canada, responsibility for transportation safety involves many stakeholders, including the federal, provincial, territorial and municipal governments; industry; and non-governmental organizations that focus on transportation safety.

The federal government regulates and co-ordinates safety-related issues in the following areas: aeronautics and airports; air and marine navigation; marine shipping facilities; commercial shipping; new motor vehicle standards; and railways and canals connecting provinces with each other or with the United States.

Transport Canada works closely with other federal government

agencies to maintain nation-wide safety. These agencies include the Transportation Safety Board, an independent agency that investigates and reports to Parliament accidents and system failures in the air, rail and marine modes.

The transportation sector as a whole is composed of mature industries that are well represented through strong industry associations that deal with their constituents' concerns and that are equally interested in maintaining and promoting the safety of their operations and products. These stakeholders share the concerns of users, private consumer-oriented organizations, and the federal, provincial, territorial and municipal

governments about maintaining the ongoing safety of Canada's transportation system.

This chapter reviews three aspects of transportation safety today: transportation occurrence statistics; an estimate of the total value of transportation accident losses; and the various levels of governments' initiatives for promoting transportation safety in 1997.

#### Transportation Occurrences

In general, statistics indicate that transportation safety in Canada is improving. In most modes, safety

## TABLE 6-1 TRANSPORTATION OCCURRENCES 1997 vs. FIVE-YEAR AVERAGE

	Aviation	Marine	Rail	Road <sup>1</sup>
Accidents				
Five-year average	394	729	1,158	710,692
Most recent year	352	528	1,125	660,708
Fatalities				
Five-year average	88	33	121	3,482
Most recent year	76	24	107	3,082
•				

<sup>1</sup> Road accidents are for 1996 (the most recent statistics available) and for the 1991 – 95 period; all others are for 1997 and 1992 – 1996.

Source: Transportation Safety Board; Statistics Canada

OCCURRENCES IN AVIATION TRANSPORTATION 1988 – 1997						
Aviation	Acci	dents	Accident Rate 1	Fatalities		
1988	49	97	13.7	95		
1989	48	32	12.9	155		
1990	4:	98	14.6	91		
1991	4	53	13.7	373		
1992	4:	35	13.1	80		
1993	42	22	12.1	102		
1994	38	30	10.1	80		
1995	39	90	10.3	107		
1996	33	39	8.8	70		
1997	3	52	9.0	76		

TARIF 6-2

Source: Transportation Safety Board

has increased considerably over the past 10 years; in every mode, it has improved over the past five years. In the area of road safety, for example, the total number of accidents in 1996 was approximately seven per cent lower than the average of the previous five years (660,708 accidents in 1996, compared with an average 710,692 from 1991 - 1995). The number of fatalities in 1996 was more than ten per cent lower than the previous five-year average (3,082 accidents in 1996 - 400 fewer than the 1991 - 1995 average of 3,482).

The accident rate, which takes into account the level of activity in

each mode, also shows a general downward trend. Aviation statistics. for example, report an accident rate that is almost 17 per cent lower in 1997 than the 1992 - 1996 average, i.e. nine versus 10.8 accidents per 100,000 hours flown. Marine statistics indicate an accident rate of 3.9 per 1,000 arrivals or departures of vessels in 1997, as opposed to 4.2 average over the previous five years. For rail, the 1997 rate of nine was down slightly in comparison to the five year average rate of 9.3 accidents per million train kilometres.

In the aviation, marine and rail modes, the most recent data list

some 2,005 accidents, with 207 aviation, marine and rail fatalities in 1997 – a year in which accidents decreased slightly in the rail and marine modes, but increased slightly in the aviation mode. Yet, despite the overall decrease in transportation occurrences, 1997 was marked by some major accidents: rail accidents at Biggar and Lytton; the aviation accident at the Fredericton airport; and the bus accident at Les Éboulements, Quebec.

Table 6-1 compares transportation occurrences with the five-year average.

#### AVIATION

#### **Domestic Operations**

In 1997, there were 352 accidents involving Canadianregistered aircraft (excluding ultralights). This figure is three per cent higher than in 1996, but well below the 1992 - 1996 average. Despite the slight increase, the long-term trend remains downward. It is estimated that the number of hours flown has increased slightly for 1997, resulting in an estimated accident rate of nine accidents per 100,000 flying hours. There were 76 fatalities in 1997, an increase of seven per cent over 1996, a figure 14 per cent lower than the 1992 - 1996 average.

Typically, private operators are involved in the majority of accidents. Most commercial accidents involve air taxi or specialty aircraft. To address this finding, Transport Canada and the aviation industry have established a Task Force on the Safety of Air Taxi Operations (SATOPS). Its objective is to propose ways to improve the safety record of the air-taxi segment of the aviation industry.

<sup>1</sup> Accident rate is the number of accidents per 100,000 hours flown

Table 6-2 summarizes transportation occurrences in aviation from 1988 to 1997.

Averaged over the five-year period from 1992 to 1996, there were 394 accidents per year, producing an accident rate of 10.8, and an average of 88 fatalities per year.

### **International Comparisons**

There are significant differences in the accident and fatality rates of Canadian and American airline operations, as shown by the data reported in Tables 6-3 and 6-4.

# Scheduled and Non-Scheduled Airline Operations

In 1996, large commercial carriers (Level I) and charter and regional carriers (Level II) accounted for two thirds of the total hours flown. but only five per cent of fatal and non-fatal accidents. In fact, there has not been a fatal accident involving Level I carriers since 1984. Level II carriers have suffered only two major fatal accidents in recent years: the Nationair accident in Jeddah, Saudi Arabia, in July 1991 and the Air Ontario accident at Dryden, Ontario in March 1989. Table 6-3 shows accidents and fatality rates for Level I and II carriers.

#### Small Air Carrier Operations

The majority of Canadian commercial accidents are in Levels III to VI – aircraft flown by commuter, air-taxi, and aerial-work services, and training clubs. The flying environment within which these operators work, the level of experience of pilots and, in some cases, the age of the aircraft are major factors contributing to these accidents.

Levels III to VI accounted for one third of total hours flown but 95 per cent of the fatal and non-fatal accidents. With respect to accident

TABLE 6-3
ACCIDENT AND FATALITY RATES IN CANADA AND THE US
FOR LEVEL I AND II AIR CARRIERS
1990 – 1996

	1990	1991	1992	1993	1994	1995	1996				
Accident R	ate										
Canada <sup>1</sup>	0.600	1.045	0.870	0.844	0.585	0.782	0.390				
US <sup>2</sup>	0.276	0.341	0.278	0.254	0.207	0.294	0.303				
Fatality Ra	te										
Canada <sup>1</sup>	0.300	20.891	0.000	0.591	0.000	0.284	0.325				
US <sup>2</sup>	0.317	1.444	0.367	0.163	1.659	1.107	2.439				
	Ave	rage Acc	ident Ra	tes (1992	- 1996)	:					
Canada - 0.694; United States - 0.267											
	Average Fatality Rates (1992 – 1996):										
	Ca	nada – 0.2	240; Unit	ed States	-1.147						

Rate per 100,000 hours flown

Includes air carriers levels I and II

2 Includes US air carriers operating under 14 CFR 121, scheduled and non-scheduled (airlines), and air carriers operating under 14 CFR 135, scheduled service (commuter airlines)

Source: Canada Transportation Safety Board; US National Transportation Safety Board

# TABLE 6-4 ACCIDENT AND FATALITY RATE IN CANADA AND THE US FOR LEVEL III AND IV AIR CARRIERS 1990 – 1996

	1990	1991	1992	1993	1994	1995	1996
Accident	Rate						
Canada <sup>1</sup>	17.620	15.401	14.823	13.434	10.517	16.667	14.810
US <sup>2</sup>	4.713	3.882	3.782	3.814	4.265	3.927	4.574
Fatality Ra	ate						
Canada <sup>1</sup>	2.918	5.640	. 2.323	4.848	4.032	6.152	3.014
US <sup>2</sup>	2.223	3.124	3.385	2.312	3.161	2.723	3.102
	Δνα	rage Acc	rident Ra	tes (199	2 - 1996	).	

Canada – 14.050; United States – 4.072

Average Fatality Rates (1992 – 1996): Canada – 4.074; United States – 2.936

Rate per 100,000 hours flown

1 Includes air carriers Levels III to VI (commuter, air taxi, and aerial work services, and training clubs)
2 Includes United States air carriers operating under 14 CFR 135 non-scheduled service (air taxi)

Source: Canada Transportation Safety Board; US National Transportation Safety Board

occurrences in Levels III to VI, significant topographical differences among the regions where carriers operate contributed most to the occurrence of accidents. The Rockies in the west and the vast lake-covered areas in Ontario offer less friendly environments for aviation. Table 6-4 shows accidents and fatalities for Level III and IV carriers.

## MARINE

Marine transportation statistics reveal a general downward trend in accidents and accident rates after 1990, indicating that the level of marine safety has improved over this period.

TABLE 6-5
OCCURRENCES IN MARINE TRANSPORTATION
1988 – 1997

Year	No. of Accidents	Accident Rate1	Fatalities
1988	926	4.3	53
1989	1,013	5.7	90
1990	1,056	5.8	57
1991	904	5.5	42
1992	840	4.5	29
1993	710	4.1	35
1994	797	4.5	40
1995	695	3.9	39
1996	604	3.9	23
1997	528	3.9	24
1992–96 Average	729	4.2	33

<sup>1</sup> Accident rate is the number of accidents per 1000 vessel arrivals and departures

Source: Transportation Safety Board

TABLE 6-6
OCCURRENCES IN RAIL TRANSPORTATION
1988 – 1997

Year	No. of Accidents		Accide	ent Rate <sup>1</sup>	Fatalities		
	Pre-TSB Criteria	Post-TSB Criteria	Pre-TSB Criteria	Post-TSB Criteria	Pre-TSB Criteria	Post-TSB Criteria	
1988	1,015		8.1		111		
1989	927		7.7		142		
1990	904		8.2		103		
1991	991		8.3		124		
1992	923	971	7.7	8.1	137	137	
1993	861	1,022	7.0	8.3	116	116	
1994	920	1,206	6.9	9.1	112	112	
1995	879	1,248	7.0	10.0	120	120	
1996	1,016	1,305	8.4	10.8	119	119	
1997	831	1,125	6.6	9.0	107	107	
1992-96 Average	920	1,158	7.4	9.3	121	121	

<sup>1</sup> Accident rate is number of accidents per million train-kilometres

Source: Transportation Safety Board

The industry reported a total of 528 shipping accidents in 1997 – a 19-year low, a 12.5 per cent decrease from 1996, and a 27 per cent decrease from the 1992 – 1996 average of 729. These decreases coincide with a continuing decrease in fishing activities and an apparent reduction in shipping movements.

There was also a 27 per cent decrease in the number of fatalities from the 1992 – 1996 annual

average. Fatalities have declined since 1994. In recent years, approximately half of all marine fatalities have resulted from accidents aboard ship. Table 6-5 outlines occurrences in marine transportation.

Averaged over the five-year period from 1992 – 1996, there were 729 accidents, producing an accident rate of 4.2, and an average rate of 33 fatalities per year.

There were 29,000 commercial registered vessels in Canada in 1997, of which 21,367 were fishing vessels. The total number of accidents involving commercial vessels declined from 279 in 1996 to 188 in 1997, a 33 per cent reduction. However, the number of Canadian fishing vessels involved in shipping accidents has remained fairly constant in the last two years.

Historically, accidents involving fishing vessels constituted the largest portion of shipping accidents, accounting in 1997 for 54 per cent of the total.

The commercial accident rate, involving both Canadian and foreign-flag vessels, has remained relatively stable since 1992, with a slight decrease since 1995.

## RAIL

# **Domestic Operations**

Railway occurrences that were collected by Transport Canada became reportable to the Transportation Safety Board (TSB) in 1990, the year the Board was established.

In 1997, 1,125 railway accidents were reported, down 14 per cent from 1996 and down three per cent from the 1992 – 1996 annual average. This represents an accident rate of nine accidents per million train-kilometres, using an estimated 125.5 million train-kilometres as the 1997 activity base. The figure is down from the 1996 rate of 10.8 and the 1992 – 1996 average of 9.3.

Of the total number of railrelated accidents reported in 1997, train derailments and collisions in yards, spurs, or sidings caused 38 per cent; crossing accidents, 27 per cent, and main-track derailments, 16 per cent. Table 6-6 summarizes occurrences in rail transportation. The 107 fatalities reported in 1997 represent the lowest number of fatalities since 1990, down from the five-year average of 121. Most fatalities result from crossing and trespassing accidents.

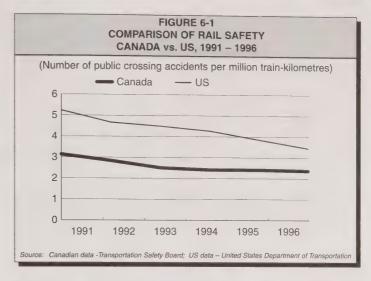
## **International Comparisons**

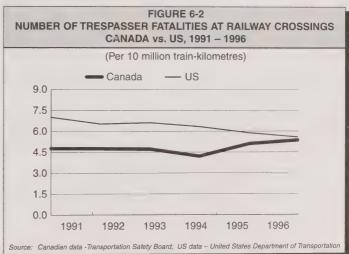
Comparison of rail safety with the United States over the 1991 – 1996 period shows that both countries have experienced significant reductions in public-crossing accident rates and that Canada's rates were 30-40 per cent lower than those in the United States throughout the period being examined. Figure 6-1 compares Canada's rail safety with rail safety in the US.

Several factors may have contributed to Canada's lower accident rate, for example, the United States' greater population density and greater per-capita usage of motor vehicles, which produce greater levels of exposure to risk.

The annual trespasser-fatality rate in Canada has remained relatively constant over this five-year period, while the US rate has decreased by over 20 per cent. Figure 6-2 shows the number of trespassers killed per 10 million train-kilometres.

Transport Canada recognizes that more can be done to improve the level of rail safety in Canada. In 1996, in co-operation with industry, interest groups, provinces and municipalities, the department launched a ten-year program to reduce grade crossings and trespassers fatalities by 50 per cent. The focus will be on public awareness and education programs, enhancement of enforcement measures, and research on technical improvements.





# TABLE 6-7 TOTAL ROAD COLLISIONS AND CASUALTIES 1988 - 1996

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996
Casualty Collisions <sup>1</sup> Persons Killed <sup>2</sup> Persons Injured <sup>3</sup>	193,605 4,154 278.618	192,428 4,246 284,937	3,965	3,691	172,713 3,500	171,205 3,614 247,582	3,260	3,347	-,

Casualty collisions includes all reportable motor vehicle crashes which result in fatalities and injuries.

3 Persons injured includes all those who suffer any visible injury or complain of pain.

Source: 1996 Canadian Motor Vehicle Traffic Collision Statistics collected by Transport Canada in co-operation with the Council of Motor Transport Administrators

#### **TABLE 6-8** ROAD FATALITIES BY CATEGORIES OF ROAD USERS 1991 - 19961992 1993 1994 1995 1996 1991 1.534 Drivers 1,780 1.752 1.806 1.646 1.674 969 860 936 833 Passengers 970 962 462 Pedestrians 533 444 479 427 415 64 59 **Bicyclists** 102 75 81 85 Motorcyclists 231 186 213 163 165 128 93 66 Not stated/Other 75 74 73 79

Source: 1996 Canadian Motor Vehicle Traffic Collision Statistics collected by Transport Canada in co-operation with the Council of Motor Transport Administrators

#### ROAD FATALITY RATE BY PROVINCE 1993 - 1995Annual average number of fatalities per 10,000 motor vehicles registered 3.5 3.0 2.5 2.4 2.4 2.5 2.0 2.0 1.8 1.8 2.0 1.5 1.5 1.2 1.0 0.5 0.0 Que Ont Man Sask Alta BC Yuk NWT Canada

FIGURE 6-3

## ROAD

## **Domestic Operations**

Approximately 95 per cent of all transportation fatalities occur on the roads. Table 6-7 relating to total road collisions and casualties shows a general downward trend with respect to the number of casualty collisions, as well as persons killed and injured. The table reports total road collisions and casualties.

The number of collisions has been steadily declining. Figures for 1996 are five per cent below 1995, and seven per cent below the 1991 – 1995 average. The number of persons killed also declined in 1996: eight per cent below the 1995 figure and 11 per cent below the 1991 - 1995 average.

Table 6-8 depicts the number of fatalities classified by six major categories of road users. Downward trends are apparent in all but the pedestrian category over the 1991 - 1996 period. There was no clear trend in pedestrian fatalities over this period.

The fatality rate has been declining steadily in Canada over the years but varies considerably among provinces, as depicted in Figure 6-3.

As shown in Figure 6-4, commercial vehicles are involved in only eight per cent of all collisions, but account for

NB

Source: Road Safety and Motor Vehicle Regulations

Persons killed includes all those who die as a result of involvement in a reportable traffic collision within 30 days of its occurrence (in Quebec, within 8 days).

18 per cent of all fatalities because of large vehicle mass.

## **International Comparisons**

Figure 6-5 compares fatality rates among member countries of the Organization for Economic Co-operation and Development (OECD), and demonstrates that in 1995, Canada was ranked seventh among OECD countries.

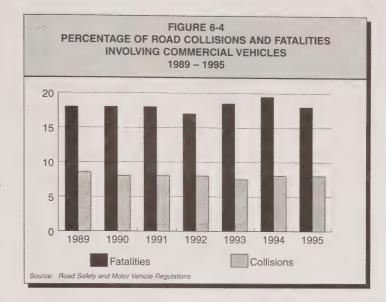
Vehicle ownership is considered a safety factor reflecting the level of concentration of motor vehicle activity and exposure to risk.

Canada's vehicle ownership was 58 per 100 inhabitants in 1995, compared with 73 in the United States, the country that ranked highest among OECD countries.

# ESTIMATES OF VALUE OF ACCIDENT LOSSES

While the previous section focused on transportation accidents and fatalities, this section extrapolates this information to explore the economic cost to society of transportation accident losses. The section estimates (within an order of magnitude) the total value of transportation accident losses. This estimate is intended to help place the significant investments made by all levels of governments on transportation safety in context with economic repercussions of losses caused by transportation accidents.

The estimated value of accident losses was based on the guidelines in the department's Guide to Benefit-Cost Analysis, and an earlier departmental paper assessing the methods, to which interested readers are referred.





<sup>1</sup> Lawson, JJ: The Valuation of Transport Safety, Transport Canada Report TP 10569, Economic Evaluation Branch, May 1989.

# TABLE 6-9 ANNUAL NUMBER OF ACCIDENTS, FATALITIES AND INJURIES

TATALITIES AND INCOMES								
Mode	Accidents <sup>1</sup>	Fatalities	Injuries					
Roads	670,000	3,082	230,885					
Rail	1,305	119	128					
Marine	604	23	71					
Air	339	70	38					
Total		3,294	231,122					

<sup>1</sup> The number of road accidents includes accidents without injuries, as based on the 1993–95 average. Figures for other modes are based on 1996 data

Source: Road Safety and Motor Vehicle Regulations; Transportation Safety Board

# TABLE 6-10 ESTIMATED AVERAGE COST OF FATALITIES, INJURIES AND PROPERTY DAMAGE RESULTING FROM ROAD VEHICLE ACCIDENTS

Severity of accident	Occurrences	Compensation cost per occurrence (1996 dollars)	Economic cost (billions of 1996 dollars)
Fatalities	3,294	1,560,000	5.1
Injuries (Road)	230,885	28,000	6.5
Property damage (Road)	670,000	5,600	3.8
Total			\$15.4
Source: Road Safety and Motor Vehicle	e Regulations; Transporta	ation Safety Board	

The concept accepted by most economists in valuing such intangibles as accident losses (or lost travelling time, or environmental damage) is that they should be given money values directly analogous to market prices, determined from what people would be willing to pay to avoid them. For transport accidents, it is proposed that the relevant people are those facing the risk of transport, and the relevant question what those people would each be willing to pay for a reduction in their risk, or to avoid an increase in their risk.

Numerous research studies have been conducted during the past few decades in an attempt to reveal these values. The studies are by no means definitive, however, producing a wide range of values. The department's assessment for the Guide to Benefit-Cost Analysis was that the value per fatality avoided was \$1.5 million, in 1991 values, or \$1.6 million in 1996 values. Injury and property damage losses are valued by the department by the losses that arise, though the estimates have to date been made only for road accidents.

Table 6-9 outlines the average numbers of accidents, fatalities and injuries for all modes. The figures used in Table 6-10 reflect only the estimated average cost of property damage resulting from road vehicle accidents. The relevant total amount of losses in 1996 are derived from the values and numbers reported in these two tables. It can be seen that the total amounted to over \$15 billion.

# 1997 CONTRIBUTIONS TO TRANSPORTATION SAFETY

This section provides an overview of transportation safety initiatives and related expenditures in 1997 by federal and provincial governments. Provincial information was provided by the government agency responsible for transportation safety.

Industry and non-governmental organizations have always played a key role in contributing to the safety of the transportation system. Now that partnerships between governments and the private sector, along with alternative service delivery, are becoming more prevalent, the contribution of these organizations is becoming even more important than it has been in the past. While this report recognizes the importance of these organizations' roles, it does not attempt, here, to present the contribution made by industry and non-governmental organizations to transportation safety.

The following paragraphs give an overview of the federal government's safety-related initiatives and expenditures undertaken in all modes and jurisdictions across Canada. These activities have focused primarily on four areas: safety inspection and monitoring of compliance with safety legislation and regulations; safety enforcement; public safety-awareness education programs; and research and development.

Transport Canada's 1997/98 budget for safety and security was in the order of \$230 million. Approximately \$178 million of this budget was allocated to various safety-related initiatives as identified in the following paragraphs. The other \$52 million was allocated for aircraft services and other multimodal safety-related activities. In addition to Transport Canada's expenditures, the Department of Fisheries and Oceans allocated approximately \$135 million for activities related to marine safety.

Initiatives related to infrastructure improvements, such as widening of roads, are excluded in this report. While such initiatives allow for increased traffic flow and enhance safety, they also pose a difficulty in allocating costs to one or the other of these two main benefits.

# FEDERAL SAFETY INITIATIVES

#### Aviation

Under the Aeronautics Act, the federal government has the lead responsibility for the safety and security of aerodromes and airports, the licensing and training of personnel, the airworthiness of aircraft, the safety and security of commercial air services, and the air navigation system, including operating and flight rules. During 1997, Transport Canada spent \$93 million on aviation safety.

Four major safety initiatives marked the department's 1997 aviation safety activities:

- During the conference on Asia Pacific Economic Co-operation (APEC), Canada joined other member countries' efforts to devise systems and infrastructure that could mitigate the inherent safety risks associated with rapid growth of air transportation in the Asia-Pacific region.
- The department guided the process leading to the entry into force of an amendment to the Convention on International Civil Aviation. The amendment

addresses potential liability problems arising from significant increases in the lease, charter and interchange of aircraft due to globalization of air transportation services.

- The department introduced new performance-based regulations governing the Nav Canada's operation of the air navigation system, and monitored, on a day-to-day basis, compliance with technical standards in the Canadian Aviation Regulations.
- A joint industry/government task force was established to improve the safety of air taxi operations (SATOPS).

#### Marine

Transport Canada has the primary responsibility for the *Canada Shipping Act*, and in this regard, it shares responsibility with the Department of Fisheries and Oceans (DFO) for marine safety and environmental protection. DFO's responsibilities in two areas include pleasure craft, search-andrescue operations, environmental protection, and national emergency preparedness. The department also promotes boating safety to the marine public through prevention and regulation.

Transport Canada's marine safety expenditures for 1997 totaled \$27 million while DFO expenditures totaled \$135 million.

The two departments undertook or completed several major marine safety initiatives in 1997. A significant undertaking for Transport Canada is the reform of Canada's maritime shipping law through the two-track modernization of the *Canada Shipping Act*.

A major accomplishment was the department's introduction of Port State Control. This enables Transport Canada to inspect foreign ships entering Canadian ports, to determine compliance with international maritime conventions for enhancing the safety of life at sea and protecting the marine environment.

The department also introduced the International Safety
Management (or ISM) Code. The
Code, called Safety of Life at Sea,
deals with safety and pollution
prevention by marine companies. It
covers both vessel and shore-side
operations.

DFO's activities to support the prevention of recreational boating accidents included national advertising campaigns, courtesy examinations, safety publications, video and television productions, and extensive regional efforts tailored to specific client needs.

#### Rail

Through Transport Canada, the federal government is responsible for the Railway Safety Act, which authorizes the Minister to govern rail safety through a regulatory framework that provides railway companies with greater flexibility to manage their operations safely and efficiently. The Act also provides for protection of public safety where railways cross highways and other roads. The federal government is also responsible for the safety of interprovincial and cross-border railways and specific intraprovincial rail lines.

In 1997, a considerable portion of the rail safety budget, which totaled \$17.4 million, went to several major federal programs focused on reducing accidents at railway and highway grade crossings, as well as trespassing accidents.

One such program, *Direction* 2006, begun in 1995 and designed to take place over 10 years, involves co-operation with industry, interest groups, provinces and municipalities. The program's objective is to reduce by 50 per cent fatalities that occur at grade crossings or through trespassing. The program utilizes publicawareness education initiatives, enforcement of safety regulations, and research on technical improvements.

Another program has introduced regulations for new fencing and railway/road crossings. The regulations set standards for the safe construction, operation and maintenance of railway crossings, and will clarify the roles and responsibilities of both municipal and provincial road authorities, as well as the railway companies, regarding who must install fences or barriers to prevent trespassing and to reduce access to railway rights-of-way.

Transport Canada also partners with or contributes to the efforts of other organizations interested in increasing railway-related safety programs. For example, the department contributes \$200,000 annually to Operation Lifesaver, a joint education program with the Railway Association of Canada, to promote public awareness of safety programs and the dangers of railway/road crossings.

In addition, in 1997 the department introduced a comprehensive program to monitor railway equipment. Moving away from an inspection-based approach, the new program is expected to improve overall railway safety over the next five years.

#### Road

Transport Canada carries out federal responsibility for road

safety under the *Motor Vehicle*Safety Act by establishing national standards for the design and construction of motor vehicles and for motor-vehicle emissions. While the department is also responsible for regulating the safe operation of extra-provincial carriers, this responsibility is delegated to provinces.

Federal road-safety programs to improve overall road safety are focused on regulatory compliance, public awareness education, research and accident investigation.

The Canadian Council of Motor Transport Administrators, which includes membership from all levels of government and private organizations, co-ordinates all matters dealing with the administration, regulation and control of drivers and vehicles.

In 1997, Transport Canada's budget for road safety totaled \$16 million.

During the year, the department launched Vision 2001, a major road-safety program created to help Canada achieve a safety record that will establish a benchmark for other countries. The program expects to achieve this goal through six initiatives: raising public awareness on road safety issues; improving communication, coordination and collaboration among agencies; promoting seat-belt use; addressing public concerns over air-bag deployment; developing more efficient enforcement to deal with problem areas (such as impaired driving, repeat offenders and high-risk drivers); and improving the collection and quality of data to ensure that road-safety programs are practical and cost effective.

In addition to its ongoing work and initiatives such as Vision 2001, Transport Canada's 1997 expenditures included its annual contribution of \$4 million under funding agreements with the provinces and territories to assist in the implementation of the National Safety Code. The Code is another joint responsibility for which all levels of government share responsibility for ensuring the safe operation of commercial vehicles.

# Transportation of Dangerous Goods

Transport Canada carries out the federal government's responsibilities under the Transportation of Dangerous Goods Act through compliance activities, safety promotion, research and development, emergency response assistance plans, and operation of the Canadian Transport Emergency Centre (CANUTEC). The Centre provides a 24-hour-a-day information and communication service as well as advice in emergency situations involving dangerous goods.

In 1997, the department's budget for activities related to the transportation of dangerous goods totaled \$8.9 million.

Two major initiatives took place in 1997. One was the department's revision of its accident-severity methodology, an indicator of program performance that ranks the consequence of accidents as they relate to people, property and the environment. The other initiative was the department's work associated with providing a "clear language" update of the Transportation of Dangerous Goods Regulations. The less legalistic language will make the regulations easier to understand for the truckers and other industry personnel who use them most.

# Security and Emergency Planning

Transport Canada's responsibilities for ensuring that Canada has a secure transportation system are focused on two main areas. One area involves overseeing the establishment and operation of alternative policing and security services following RCMP withdrawal from several international airports. The other area involves transferring responsibility for airport security screening equipment from the federal government to the airline industry.

The department's 1997 budget for security and emergency planning totaled \$8.2 million.

On the regulation front, two of the year's major accomplishments were the department's implementation of marine transportation security regulations for cruise ships and cruise ship facilities, and its implementation of a rail security program through a Memorandum of Understanding with the Railway Association of Canada.

The department also completed the National All-Hazards Plan, which will ensure relief is able to reach areas stricken by natural disaster.

Another major milestone for 1997 was the establishment, in partnership with the aviation industry, of the National Transportation Security Awareness Program.

### Research and Development

Transport Canada implements the federal government's responsibility for managing a multimodal research and development program whose budget totaled \$7.4 million in 1997. The research program supports federal objectives relating to safety and security, accessibility, energy efficiency, and sustainable transportation.

The 1997 fiscal year was an especially productive one for the research program.

The program's research results contribute to the department's overall effort to increase the safety of the transportation system. Improving standards and guidelines for safe aircraft operation in winter, such as focusing on the evaluation of de-icing and anti-icing fluids, is an example of how research results can be applied to improved safety practices. Similarly, the department's research work contributes to better rail inspection technology to detect and replace flawed rails and other safety defects before they cause derailments.

Research on pilot, air traffic controller, truck driver, and marine operator fatigue and performance under realistic conditions led to improved safety practices.

Other highlights of the year included research with marine operating partners to upgrade design standards and regulations for improving safety; development of Sailsafe, an electronic chart display and information system designed to facilitate navigation in all weather; determination of the inspection technology best suited to in-service detection of defects in tank-car insulation; a program to collect tank-car-yard impact force data under various vehicle and operating conditions; and research into a number of explosive trace-detection systems, based on such technologies as lasers, gas chromatography, and ion-mobility spectrometry.

# PROVINCIAL/MUNICIPAL TRANSPORT SAFETY INITIATIVES

### Rail

Provincial governments are responsible for the safety of intraprovincial shortline rail transportation. Provincial and municipal governments share jurisdiction over roadways approaching rail crossings, and the enforcement of provincial legislation governing driver behaviour.

The provincial and municipal governments focus mainly on those initiatives that will reduce railway/highway grade crossing and trespassing accidents.

Consequently, these governments, whose annual contribution amounts to \$20 million, contribute toward approach roads and improvements to crossing signals and fencing. Provincial railway safety provisions are consistent with federal requirements promoting railway safety in Canada.

### Road

The provinces are responsible for driver testing, vehicle inspection, and enforcement of safety regulations to improve road safety in their jurisdictions. Municipalities are responsible for enforcement of provincial regulations and for improvement of road infrastructure to ensure safety in their jurisdictions.

The following summaries describe the road safety-related initiatives and expenditures reported to Transport Canada by provincial governments. (Municipal government expenditures are not included.) The summaries, however, are only indicators of provincial activities and should not be used for making

comparisons among provinces or for drawing conclusions about provincial expenditures. In addition, these summaries do not capture police-agency efforts to enforce legislation governing the operation of private vehicles.

# Transportation of Dangerous Goods

Regulations under the Transportation of Dangerous Goods Act are adopted by provincial, territorial and municipal governments to establish one common program of safety requirements. Expenditures on safety compliance measures planned by these governments were not captured in this report.

#### British Columbia

This province's transportation budget totaled \$630 million in 1997. Approximately \$30 million went to such major road-safety initiatives as the consolidation of its Motor Vehicle Branch and the Road Sense Program of the Insurance Company of British Columbia. The consolidation will help the province to plan, develop and deliver traffic safety programs more efficiently, thereby resulting in a more focused and effective approach to road safety.

## Alberta

Alberta's total transportation budget for 1997 was \$634 million. Approximately \$34 million, or five per cent of that total, was directed to specific road-safety initiatives.

Alberta, in conjunction with a number of public and private sector partners, has been pursuing a five-year major traffic-safety initiative since 1996. The initiative has three primary goals, all aimed at the vehicle driver: education, awareness, and enforcement. The

program's intent is to make drivers more conscious of their responsibilities on the road, and to foster reductions in the number of traffic collisions, both in terms of fatalities and the number and severity of accidents involving injuries.

#### Saskatchewan

Saskatchewan's transportation budget totaled \$170 million in 1997, with approximately \$5 million, or three per cent, spent on specific road-safety programs.

Saskatchewan conducts its major safety efforts through traffic officers and investigative personnel located province-wide. Safety initiatives focus on regulation, safety and compliance.

One of Saskatchewan's major programs is "Agenda 2000: Traffic Safety in Saskatchewan," a five-year traffic-safety plan to reduce traffic injuries and fatalities by 25 per cent by the year 2000.

Another initiative called for increased inspection of vehicles for mechanical defects, with particular attention to be directed to identifying safety hazards. The province also implemented a joint truck inspection facility with Alberta, improved the traffic-accident information system, and increased public education and awareness.

#### Manitoba

Of a total 1997 budget of \$223.7 million, Manitoba allocated approximately \$7 million, or three per cent, to specific road-safety initiatives.

The province's road transportation safety and regulatory activities were designed to improve the safety performance of drivers and motor vehicles, commercial trucks and buses. Initiatives related to drivers involved driver skills improvement and testing; setting medical standards; licensing; monitoring driver records on accidents and traffic violations; and monitoring and controlling drivers' abuse of alcohol and drugs.

Motor vehicle safety improvements focused on vehicle registration and monitoring vehicle standards.

Safety initiatives for commercial trucks and buses included testing commercial vehicles, inspecting truck transportation, and monitoring a comprehensive code of minimum performance standards for the safe operation of commercial vehicles.

### Ontario

Ontario's total transportation budget for 1997 totaled \$1.9 billion, of which approximately \$117 million, or six per cent, was applied to specific road safety initiatives.

There are three key elements in Ontario's road-user safety program: policy, licensing, and compliance and enforcement of regulations that apply to commercial carriers. The province undertook three specific initiatives in 1997. It increased the trucking industry's responsibility for safety compliance, and provided incentives for safe operation of industry vehicles; it increased penalties for non-compliance and immediately removed unsafe drivers and vehicles from the roads; and it made problem road users contribute to the cost of enforcement, and of education and rehabilitation programs.

### Quebec

Quebec allocated its total 1997 road safety budget of \$102 million to various road-safety initiatives.

The province developed a transportation safety program for the road sector in co-operation with external stakeholders such as police authorities, transportation associations and municipalities. By the year 2000, this program expects to reduce the number of road incidents and accidents by approximately 25 per cent. Reaching this goal would reduce the annual number of deaths to about 750 and the number of serious injuries by close to 5,000.

### New Brunswick

This province allocated out of its total road transportation budget a sum of about \$3.8 million to various road-safety initiatives, primarily in the areas of regulation and compliance measures and safety promotion activities.

#### Nova Scotia

Nova Scotia's total 1997 transportation budget was \$250 million, of which approximately \$3 million was dedicated to improvement of transportation safety. Safety initiatives related mainly to improvement of highway safety through implementation of the demerit point system for commercial carriers. The province also dedicated a portion of the \$3 million to improving the safety of provincial bridges through implementation of a long-term bridge rehabilitation and replacement program.

### Prince Edward Island

With a total transportation budget of \$39 million for 1997, Prince Edward Island earmarked approximately \$2.4 million, or six per cent, for various safety initiatives. The majority of these initiatives related to licensing, registration, monitoring, inspection and enforcement.

## Newfoundland and Labrador

With a 1997 transportation budget totalling \$127 million, Newfoundland and Labrador directed approximately \$4 million, or three per cent, to such safety initiatives as implementation of motor-vehicle road safety improvement programs and establishment of a safe, efficient and environmentally sustainable transportation system that includes primary and secondary highways, community access roads, air services and marine operations.

# ENVIRONMENT

The emerging focus on sustainability and the Kyoto Protocol to the Framework Convention on Climate Change are part of the new challenges facing Canada's transportation sector.

Transportation generates by-products that have a significant impact on the environment and on human health. It is widely accepted that transportation activities contribute to climate change, depletion of the ozone layer, the spread of toxic substances, local and regional air pollution – including ground-level ozone (smog), acid rain and noise – depletion of oil and other natural resources, and damage to landscape and soil.

More and more, Canadians are insisting that planners take into account the transportation system's environmental impacts. As society evolves toward sustainable development, Canadians want the

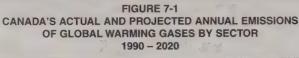
transportation system to perform its vital functions of moving commodities and providing people access to work and leisure in ways that do not harm the environment.

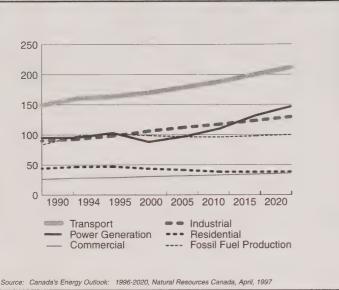
# Major Events in 1997

# TRANSPORT CANADA'S SUSTAINABLE DEVELOPMENT STRATEGY

In December 1997, Transport Canada tabled its strategy for sustainable development as required by amendments to the Auditor General Act. Sustainable development finds ways "to meet the needs of the present without compromising the ability of future generations to meet their own needs." The department's strategy integrates environmental thinking with safety and efficiency in developing policies and programs for the transportation sector.

Transport Canada's Sustainable Development Strategy has two components. The first focuses on promoting sustainable development in the transportation sector. The second concentrates on managing the department's own operations in ways that contribute to sustainable development.





For the transportation sector, the department focuses on meeting eight strategic environmental challenges:

- minimize the risk of environmental damage from transportation accidents;
- 2. promote greening of operations in the transportation sector;
- 3. reduce air emissions from transportation sources;
- 4. promote education and awareness of sustainable transportation;
- 5. assess the department's direct budgetary transfers for their environmental impact;
- 6. refine sustainable transportation performance indicators;
- 7. understand the environmental costs of transportation; and
- develop and promote the application of cleaner transportation systems and technologies.

For its own operations, the department has developed an environmental management system based on principles put forth by the International Organization for Standardization (ISO) in ISO 14000. The system's three key features are:

- going beyond simply complying with legislation by showing "due diligence" in anticipating environmental impacts and working to avoid them;
- setting targets for specific environmental improvements, such as completing Transport Canada's inventory of ozone depleting substances and eliminating in-storage polychlorinated biphenyl (PCB) waste by 2000; and
- monitoring and evaluating performance on environmental impacts and targets.

# CLIMATE CHANGE CONFERENCE IN KYOTO, JAPAN

As a signatory to the United Nations Framework Convention on Climate Change concluded in Rio de Janeiro in 1992, Canada adopted the goal of stabilizing its greenhouse gas emissions at 1990 levels by the year 2000. A National Action Program has been in place since 1995, based on voluntary actions and partnerships. Although progress has been made toward this goal, Canada (like most other countries) will not meet its target. Canadian greenhouse gas emissions from all sectors are forecast to exceed 1990 levels by eight per cent in 2000 and by 36 per cent in 2020 unless further actions are taken. Figure 7-1 provides a summary of Canada's greenhouse gas emissions since 1990.

In December 1997, the countries who signed the 1992 Framework Convention met in Kyoto, Japan to negotiate stronger emission reduction commitments for the post-2000 period. The Kyoto Protocol to the Framework Convention was concluded on December 10, 1997. Under this protocol, to be legally binding when it comes into force. industrialized countries undertake to reduce their collective emissions of greenhouse gases by 5.2 per cent from specified base years over a five year commitment period beginning in 2008. For the three principle greenhouse gases (carbon dioxide, nitrous oxide and methane), the base year is 1990. For three newer gases (hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride), the base year is either 1990 or 1995. The Protocol defines different targets for industrialized countries over this period. Canada's target is to reduce its total greenhouse gas emissions by six per cent from 1990 levels.

The protocol includes several flexibility mechanisms in meeting this target. The right of parties to trade emission reduction credits to meet their commitments is included. on the condition that such trading is supplemental to domestic actions. A Clean Development Mechanism will operate under the authority of the Conference of Parties to the Framework Convention, to enable the financing of, and the distribution of credit for, emissions-reduction projects in developing countries. The protocol permits countries national flexibility on the policies and measures they adopt to meet their targets.

The protocol requires all Parties, including industrialized and developing countries, to present national reports on emissions data and on programs to address climate change issues. The question of developing country commitments in the post-2000 period, and the details of an emissions trading regime, will be among the issues to be addressed at the next Conference of Parties to the Framework Convention in Buenos Aires in November, 1998.

The protocol will be open for signing from March 1998 to March 1999. Countries will then have the additional step of deciding to ratify the agreement. Entry into force of the protocol will depend upon ratification by 55 countries representing at least 55 per cent of developed countries' emissions.

# FEDERAL SMOG MANAGEMENT PLAN

Environment Canada, Natural Resources Canada and Transport Canada worked together in 1997 to produce the second phase of the federal government's smog management plan, released in November. Phase Two is a follow-up to Phase One, adopted in 1990, which included stricter vehicle emission standards for 1995 and 1998 model years and stricter standards for diesel and gasoline fuels.

The objectives of the second phase are to continue pursuing Canada's one-hour ambient air quality objective for ground-level ozone of 82 parts per billion by 2005; adopt a multi-pollutant approach; and meet Canada's international commitments, including those in the Canada-US Air Quality Agreement. The plan's objectives also include implementing strong national smog-reduction programs, helping provincial governments resolve regional smog problems, and tracking results against the program's objectives.

The core elements of the Phase Two plan continue federally led national initiatives to reduce smog. Among the initiatives related to transportation is work by Transport Canada, other federal departments and the transportation industry to reduce emissions from aircraft and marine vessels in line with standards established within the International Civil Aviation Organization and the International Maritime Organization. Also, there are initiatives within the transportation sector related to energy efficiency, renewable and alternative energy, new technologies and voluntary actions.

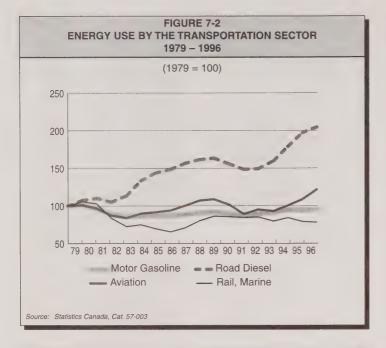
# TASK FORCE ON SUSTAINABLE TRANSPORTATION

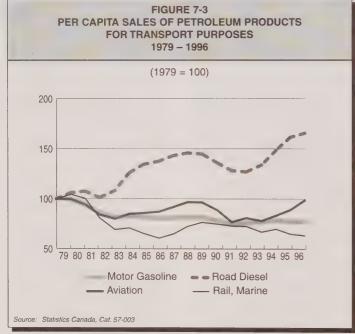
In 1996, the National Round Table on the Environment and the Economy established a program to provide all Canadians with advice on sustainable transportation, including a Task Force on Sustainable Transportation to direct research and organize multi-stakeholder consultations

The Round Table recommends implementing education and awareness programs for students, professional associations and the general public to highlight the consequences of inaction, and to provide better information about sustainable transportation options. The Round Table further recommends better government coordination to build consensus on a national strategy for sustainable transportation and to encourage municipal governments to work together toward achieving this goal.

In addition, the Round Table highlights the need for more analysis and debate on the use of economic instruments to reduce the environmental impacts of transportation, notably options derived from full-cost accounting and user-pay principles. Finally, the Round Table encourages provincial authorities to consider land-use legislation and policies that are consistent with the Transportation Association of Canada's New Vision for Urban Transportation.

In November 1997, the Task Force released its first report, State of the Debate: The Road to Sustainable Transportation in Canada. The report concludes that transportation is on an unsustainable path because of its contributions to greenhouse gas production and ground-level pollutants, including particulates and the precursors to smog. Unless current trends are stopped, impacts on the environment from transportation will increase.





# UN COMMISSION ON SUSTAINABLE DEVELOPMENT

Canada signalled its commitment to sustainable transportation by including a section called "The Challenge of Sustainable Transportation" in its 1996 report to the United Nations Commission on Sustainable Development. The preparation of a monograph on the topic reinforced this commitment in April 1997.

The monograph reviewed current transportation trends toward sustainability in Canada and elsewhere; outlined how responsibilities for transportation are shared within jurisdictions in Canada; and noted some of Canada's recent actions to promote sustainability at home and around the world. Its main goal - toward which progress was made - was to support the preparation and inclusion of a new annex to Agenda 21 (the outcome of the Rio conference in 1992) on sustainable transportation.

# TRANSPORTATION AND ENERGY

# SALES OF PETROLEUM PRODUCTS FOR TRANSPORT PURPOSES

Because emissions from transportation correlate closely with energy use, any description of the impact of transportation on air quality must include an analysis of petroleum fuel consumption. The transportation sector accounts for close to 60 per cent of all petroleum use in Canada, by far the greatest consumer in the Canadian economy.

<sup>1</sup> Sustainable Transportation, Monograph No.2, Environment Canada and Transport Canada, 1997, Sustainable Development in Canada Monograph Series.

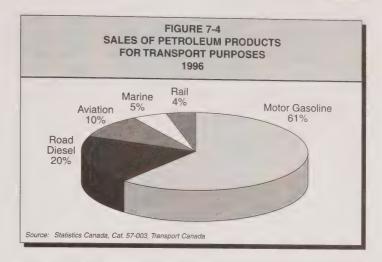
Sales of petroleum products increased overall by 7.3 per cent between 1979 and 1996, but increased sales of only two products account for this growth. Diesel fuel sales more than doubled, with growth continuing during 1996, while aviation fuel sales increased by just over 20 per cent, mostly between 1994 and 1996.

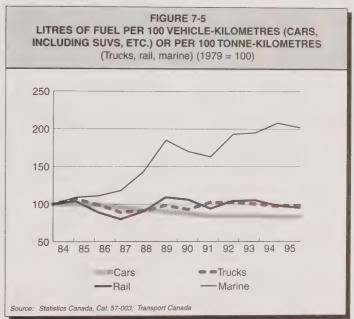
Figure 7-2 illustrates the sales of petroleum products to the transportation sector from 1979 to 1996.

Sales of gasoline, used mainly for private automobiles, remained relatively constant from 1979 to 1996, with slight growth evident during the 1990s that continued in 1996. From 1979 to 1996, private automobile use increased by an estimated 39 per cent, which suggests an improvement in energy efficiency for these types of vehicles. During the same period, however, sales of marine and rail fuels declined.

If considered on a per-capita basis, the amount of gasoline used tended to fall slightly from 1979 to 1996, as have the amounts of rail and marine fuel. Aircraft fuel used per person has remained at approximately 1979 levels, although it is currently showing an increasing trend. Diesel fuel use per capita has increased more than 50 per cent since 1979. Figure 7-3 shows transportation fuel use per capita from 1979 to 1996.

Medium-duty and heavy-duty truck activities are on the rise, thus the use of diesel fuel for road transportation. Population growth and an increase in the amount of economic activity in Canada are two reasons for these gains, but another may be the growth in the practice of "just-in-time delivery," which replaces conventional





warehousing with frequent deliveries scheduled according to production processes. Another important factor is greater reliance on distant sources for materials, components and finished goods.

Figure 7-4 shows how each transportation mode contributes to the total use of petroleum products for the movement of goods and

people. Motor gasoline and aviation fuel, which are dominant in moving people, accounted for approximately 70 per cent of the fuel used for transportation in 1996, while road diesel, marine and rail fuel accounted for the rest.

1978

1980

1982

1984

1986

1988

1990

1992

1994

1996

1997

CANADIAN MOTOR VEHICLE FUEL EFFICIENCY 1978 – 1997									
	(litres p	per 100 kilometres)							
C	ars	Light Trucks	Average						
Target	Actual	Light Trucks Target Actual	Target Actual						
-	11.5								
11.8	10.2								
9.8	8.4								
8.7	8.5								
8.6	8.2								

11.8

11.6

11.5

11.4

11.4

11.1

11.4

11.3

11.5

11.3

11.2

TABLE 7-1

7.9 Source: Transport Canada, Motor Vehicle Standards and Research Directorate

8.1

8.2

8.1

8.2

7.9

## FUEL EFFICIENCY

Canada has been working for many years to promote energy conservation in the transportation sector. As a result, the performance of most classes of vehicles, especially passenger vehicles, has improved over the last two decades.

8.6

8.6

8.6

8.6

8.6

8.6

Figure 7-5 shows trends toward fuel efficiency for all modes of transportation. It is important to note that the data used to create the figure was in tonne-kilometres, rather than vehicle- or vesselkilometres. This method of representing the information means that technical improvements in fuel efficiency for marine and rail, in particular, may be obscured by changes in commodity mix. loading or the size of vehicle used.

The exception to this fuel efficiency improvement is the growing use of vans, light trucks and sport-utility vehicles for passenger vehicles, which is offsetting gains in efficiency achieved for passenger automobiles. Table 7-1 compares the fuel efficiency of cars and light trucks with federal government targets from 1978 to 1997.

9.1

9.1

9.4

9.2

9.1

## OTHER EFFORTS

For fuel efficiency, initial design is the most significant factor in good vehicle performance, but proper maintenance is also important. In 1997, Ontario's provincial government proposed a mandatory program of vehicle maintenance and inspection, following British Columbia's lead in 1992. These programs are designed primarily to reduce ground-level ozone, but they are also likely to contribute to improved fuel efficiency.

Ontario's Drive Clean Program will begin in the summer of 1998, requiring all heavy-duty trucks and buses in Ontario to complete an emissions test as part of current annual safety testing. In the late summer or fall, the program will be extended to all cars and light trucks registered or resold within the Greater Toronto Area and the Hamilton-Wentworth region. An emissions test will be necessary every two years thereafter at registration renewal for cars and

light trucks aged four to 19 years, and any time at resale for all model years. Antique cars, commercial farm vehicles and motorcycles are not included in the program.

The BC inspection program, call "Air Care", has been law since 1992. In October 1997, it was announced that the program would be extended from the current inspection of automobiles and light trucks to cover heavy-duty truck and bus emissions by September 1998.

In addition, increasing vehicle occupancy can also help in reducing energy consumption by improving the efficiency of passenger transportation. Several municipalities have implemented "high-occupancy" lanes for vehicles carrying two or more people. Although this has generally been undertaken to reduce congestion during peak travel times rather than to reduce fuel use, it has most probably also had the latter effect.

# IMPACT OF TRANSPORTATION ON THE ENVIRONMENT

From a local as well as a global perspective, the biggest environmental challenges for transportation are related to air emissions from transport activities. Indirectly, transportation can also be associated with environmental impacts resulting from vehicle and fuel production, construction and operation of transport infrastructure.

Natural Resources Canada's publication Canada's Energy Outlook 1996-2020, indicates that in 1995, fuel consumption in the transport sector directly

	AI	R EMIS	SSION	S FRO	TABLI M TRA		RTATIO	ON SO	URCE	8	
Emission Emission contributes to:							es to:				Emissions from transportation as a percentage of all emissions
		t health blems	Sn	nog		nhouse fect	Acidepos			one letion	
Carbon monoxide (CO)	YE	ES	N	0	N	10	N	10	1	10	60
Volatile organic compounds (VOC)	YES	YES	YES	VEC	NO	VEO	NO	NO	NO		40
Nitrogen oxides (NOx)	YES	150	YES	YES	YES	YES	YES	NO	NO	NO	60
Carbon dioxide (CO <sub>2</sub> )	N	10	N	0	YE	ES	N	0	N	0	27
Sulfur oxides (SOx)	1Y	ES	N	0	N	0	YE	ES	N	0	2.2
Chlorofluorocarbons (CFCs)	N	10	N	0	YE	ES	N	0	YE	ES	25
Particulates (diesel)	YI	ES	YE	S	N	0	N	0	N	0	1.3

Source: Environment Canada, The State of Canada's Environment, 1996 (full edition)

contributed about 27 per cent of the total greenhouse gases produced by human activity in Canada.

# AIR EMISSIONS

The burning of petroleum fuels in internal combustion engines produces a variety of emissions. including carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), volatile organic compounds (VOC), nitrogen oxides (NOx), sulphur oxides (SOx), and particulates (from diesel).

Table 7-2 details the effects these emissions have on human health, the environment, or both.

In addition, transportation emits chlorofluorocarbons (CFCs) through leakage from automobile air conditioners. CFCs are contributors, along with carbon dioxide, methane and nitrogen

oxides, to the formation of greenhouse gases linked to climate change. CFCs are also a major contributor to high-altitude ozone depletion, a recognized cause of sunburn and, over time, a likely contributor to skin cancer. Nitrous and sulphur dioxides also contribute to acid rain.

Particulates from transportation are also a problem. Data from the Organization for Economic Co-operation and Development (OECD) indicates that particulates from transportation sources increased by nearly 45 per cent between 1980 and 1994, while emissions of particulates from other sources, as well as emissions of other substances from transportation, declined. Particulates are more likely to be produced by diesel than by gasoline engines, thus the increase in emissions of particulates is

consistent with the increase in diesel fuel use illustrated in Figures 7-2 and 7-3. It is not the total amount of emissions that determines the severity of health and environmental effects, rather it is the local and regional atmospheric concentrations of the substances in question.

Ground-level ozone is the only transportation-related pollutant with concentrations above what Environment Canada considers to be a desirable level. In many parts of Canada, including southern Ontario, much of the ground-level ozone, as well as the ingredients that make it, are blown in from the US, particularly from industrial and other sources in the Ohio Valley.

Breathing fine particulates is linked to health problems, including asthma and lung cancer.

# TABLE 7-3 TRENDS IN THE ATMOSPHERIC CONCENTRATION OF INDICATED POLLUTANTS

Pollutant (No. of sites)	Change in concentration (period)	Average level	Desirable level
Sulphur dioxide (59)	-61% (1974 – 1992)	16	30
Nitrogen dioxide (42)	-41% (1977 – 1992)	39	60
Particulates (73)	-55% (1974 – 1992)	39	60
Carbon monoxide (46)	-68% (1974 – 1992)	N/A	N/A
Ozone (44)	-33% (1979 – 1992)	36	30

Numbers of sites and annual average levels are for 1990. Levels are in micrograms/cubic metre (mg/m³). Desirable levels are long-term goals. There is no desirable annual level for ozone in Canada's National Ambient Air Quality Objectives and so the acceptable level is shown—the level that provides adequate protection against adverse effects on humans, animals, vegetation, soil, water, materials, and visibility. Desirable levels are generally 33-50% below acceptable levels. There is no objective of any kind for carbon monoxide based on annual averaging periods.

Source: Natural Resources Canada, Canada's Energy Outlook, 1966 - 2020, April 1997

The smallest particulates, those less than 2.5 microns, are especially harmful to health, and they are also most likely to be found in vehicle exhaust. The federal government will examine the need for national air quality standards for particulates and ground-level ozone under the second phase of the Federal Smog Management Plan.

Table 7-3 reports the concentrations of pollutants at monitoring sites across Canada, for the most part in major urban areas. Concentrations are more significant measures of particulates than total emissions because concentrations determine the severity of health and environmental effects.

# URBANIZATION AND SUBURBANIZATION

According to Canada's 1996 Census, the trend toward concentration of the population into major metropolitan areas is continuing. The four largest metro areas – Toronto, Montreal, Vancouver and Ottawa-Hull – contained 35 per cent of Canada's population in 1991, and contributed to 50 per cent of the growth in Canada's population between 1991 and 1996.

Low-density suburban sprawl is also on the increase in most of Canada's larger cities. The results are low population densities, which make transit systems less viable, and an increased need for private automobiles. This increase in travel usually translates into greater production of air pollution, particularly by automobiles and light trucks.

# OTHER ENVIRONMENTAL IMPACTS

Although exhaust emissions from transportation have significant impacts on the environment and human health, contamination of water and land cannot be ignored. Changes in the land surface resulting from transportation infrastructure also affect the environment and ecosystem integrity. For example, infrastructure can alter drainage patterns, and roads can become barriers to natural migration.

In addition, the environmental impacts of manufacturing vehicles, fuel and infrastructure come into play, as do the disposal impacts of old and unusable vehicles and parts. Noise is also an issue for people living near airports, major highways, railroad tracks and other transportation facilities.

# LOOKING AHEAD

Emerging awareness about the need for sustainability is presenting new challenges for Canada's transportation sector. One of the most important, identified in Transport Canada's Sustainable Development Strategy, is the need for performance indicators to measure progress toward sustainability on all levels: environmental, economic and social.

Canada has made much progress on smog management, but many issues remain to be addressed. Ground-level ozone and small-diameter particulates remain a concern. Greenhouse gas emissions are increasing. To reach Canada's Kyoto target and ensure progress toward sustainability, the transportation sector must reduce its emissions. Some reductions will come from technological improvements and some from changes in how Canadians move themselves and their freight.

# AIR

The Minister's Committee on Air Policy Issues, the actions of Canadian Airlines in the first year of a four-year recovery plan, the withdrawal from domestic service of two operators using jet aircraft, and the redistribution of traffic between the Dorval and Mirabel airports marked the year.

In response to today's time pressures and transportation needs, the air sector is playing an increasingly important role in enhancing Canada's business, trade and tourism interests at home and abroad

This chapter presents an overview of air services – regional, national and international – operating in Canada.

# Major Events in 1997

# LEGISLATIVE AND REGULATORY FRAMEWORK

#### **Air Transportation Regulations**

The Canadian Transportation Agency published proposed amendments to the Air Transportation Regulations, particularly in the area of international charter air services and sought comments from interested parties. The Agency also consulted informally with stakeholders on the elements of an administrative monetary penalty system as an additional tool for enforcing these regulations. Both initiatives were continuing at year's end.

# Aviation Fuel Excise Tax Rebate Program

The federal government put into place a four-year Aviation Fuel Excise Tax Rebate Program under which airline companies carrying on business in Canada would be able to obtain a rebate of up to

\$20 million a year on aviation fuel excise taxes. In exchange, they would give up their entitlement to claim losses against income subject to tax, for up to \$10 of their accumulated tax losses for every \$1 of rebate received. In addition, companies could later choose to repay the rebate received and fully reinstate the losses they had previously exchanged.

# MINISTER'S COMMITTEE ON AIR POLICY ISSUES

In November 1996, the Minister of Transport became an active participant in efforts to reach an agreement on a restructuring plan for Canadian Airlines International Ltd., which required concessions from its suppliers, creditors and work force. As part of the federal contribution and to encourage union support, the Minister agreed to establish a committee to examine air policy issues and, specifically, concerns raised by the unions regarding the future of the airline industry.

The Minister invited 11 associations representing key stakeholders in the airline industry to nominate a total of 21 persons from among their members to sit on the committee. These were representatives from unions, airlines, airports, pilots, shippers, consumers, tour operators, travel agents and the tourism industry. Transport Canada provided the Chair as well as secretariat services.

The committee met monthly from March to October 1997 in the presence of a number of observers from interested federal government departments. Meetings consisted of information gathering, review of briefs submitted by members, discussion on topics identified by the Minister and by

members, and the preparation of a report to the Minister.

The committee's report, signed by all committee members and reflecting the opinions expressed by members, was presented to the Minister in November. Given the diverse views of the participants, no consensus was reached on either the current direction of the Canadian airline industry or recommendations for its future direction.

Committee members gave their general support, however, to a number of concepts:

- Economic deregulation must not negatively affect safety.
- Canadian ownership and control requirements should be maintained.
- New entrants should be subject to a financial fitness test to increase their likelihood of remaining in operation.
- The impact of taxes, charges and user fees on pricing, growth and international competitiveness should be studied.
- It is by "growing" that the industry will be healthy and viable.

Union members on the committee continued to believe that some regulation of market entry, capacity and prices was required, as well as labour protection measures and higher levels of public accountability.

# **Public Conference on Air Policy Issues**

To complement the work of the committee and to expand the consultative process, the Minister of Transport requested the Public Policy Forum to organize a public conference involving a wider range of stakeholders and experts. The conference, entitled The Flight

Ahead, was held in Toronto in November 1997 and attracted 150 representatives from air carriers, unions, airport authorities, consumer groups, travel associations, pilots, shippers, tourism associations, the investment community, academics, the media, and officials from the federal and provincial governments. The report of the conference, published in December, expands on the issues raised by the Minister's committee.

# TRAFFIC DISTRIBUTION BETWEEN DORVAL AND MIRABEL AIRPORTS

September 15, 1997 was the official day of transfer of scheduled international services to Montreal from Mirabel to Dorval. The aim was to consolidate all scheduled services (domestic, transborder and international) at one airport with the purpose of improving and facilitating connections in Montreal. The role of Mirabel, while remaining open to all types of service, will be to specialize in passenger charter services and large aircraft cargo operations. The decision of Aéroports de Montréal to modify the traffic distribution which had been in effect since 1975 was contested in court. It was the Québec Court of Appeals which overturned the lower court decision and allowed the changes to take place.

# INTERNATIONAL INITIATIVES

## **Bilateral Negotiations**

In 1997, Canada held bilateral air negotiations with a number of foreign governments, many of which resulted in an expansion of Canadian carrier opportunities and an opening up of new markets. During the year, negotiations were held with Belgium, Chile, Cuba, Fiji, the Netherlands, Kuwait, Ukraine, New Zealand, Russia, Iceland, Switzerland, Japan and China. There were also negotiations with the Scandinavian countries, where three identical bilateral agreements govern services with Norway, Sweden and Denmark.

A first-time air agreement was concluded with Ukraine. Existing agreements with Scandinavia, Fiji, Cuba, Belgium and China were amended to include expanded new rights. The agreement with China resulted in increased capacity and a new route for all-cargo services between Canada and China. Expanded capacity was also achieved in the Canada-Japan market. A new memorandum of understanding was reached with Iceland. Amendments to the arrangements governing air services between Canada and Taiwan have made possible an expansion of Vancouver-Taipei services by Canadian Airlines International and Mandarin Airlines.

During 1997 the Minister used his authority to designate Canadian carriers to exercise Canada's bilateral route rights to fly scheduled air services to a number of countries. Table 8-1 lists carriers selected in 1997.

#### Intransit Pre-clearance

In April, Canada and the US reached agreement on the establishment of intransit pre-clearance for international air travelers arriving in Canada and destined for the US. Upon arrival at a Canadian airport, these passengers would be allowed to bypass Canadian customs and proceed directly to US customs

# TABLE 8-1 CARRIERS DESIGNATED BY THE MINISTER OF TRANSPORT IN 1997

Country	Selected Carrier
Aruba Austria Bolivia Cayman Islands Colombia Ecuador Egypt Finland France (2nd carrier) Morocco Netherlands Antilles Portugal Saudi Arabia Tunisia Turkey	Canadian*Air CanadaCanadianAir CanadaCanadianCanadianAir CanadaAir CanadaAir TransatCanadianCanadianCanadianCanadianCanadianCanadianCanadianCanada
Turks & Caicos Islands	
Venezuela  * Canadian Airlines International	
Source: Transport Canada, Air Policv	

before connecting to their US flights. This "one-stop" clearance process is more attractive to international travelers than the traditional "two-stop" process.

Canadian airports and air carriers hope to increase the levels of intransit traffic using Canadian gateways on trips to and from the United States. As a first step toward implementing intransit preclearance across Canada, a pilot project was set up in June 1997 at Vancouver International Airport. During the first six months, about 25,000 international passengers used the one-stop clearance process.

In return for US agreement on intransit pre-clearance, Canada has agreed to develop legislation that would enhance the ability of US customs and immigration inspectors to apply US law in pre-clearance facilities at Canadian airports.

### Transit Without Visa

In August, the Department of Citizenship and Immigration introduced a "transit without visa" test program at Vancouver International Airport. This program allows eligible international travelers to the US to transit through Vancouver without carrying a Canadian visa, provided they carry the necessary US visa. Initially, citizens of Taiwan, Thailand, the Philippines and Indonesia are eligible.

### Pre-clearance at Ottawa

In July, a new US customs preclearance facility opened at MacDonald-Cartier International Airport at Ottawa, the seventh Canadian airport with such a facility. Pre-clearance allows transborder travelers to be processed into the United States before the departure of their flight, as a means of facilitating their arrival at the US airport, particularly if they have connecting flights to catch.

# TABLE 8-2 AIRCRAFT OF SELECTED CANADIAN CARRIERS IN PASSENGER SERVICES

	Wide- odied	Narrow- bodied	Propeller Driven	Total
Air Canada	46	112	-	158
AC Affiliates 1	-	13	69	82
Canadian Airlines International	24	60	-	84
CAI Affiliates <sup>2</sup>	-	23	54	77
Air Transat	12	7		19
Canada 3000	-	14	-	14
First Air <sup>3</sup>	-	4	34	38
Kelowna Flightcraft 4	-	7	-	7
Sky Service	-	4	-	4
Royal <sup>5</sup>	3	12	-	15
WestJet	-	6	-	6
Vistajet 6		2	2	4
Total	85	264	159	508

Notes: 1. Air Nova, Air Alliance, Air Ontario and Air BC.

2. Air Atlantic, Inter-Canadien, Canadian Regional and Calm Air.

3. First Air fleet includes Air Inuit & NWTAir which was acquired from Air Canada.

Operating as "Greyhound Air" which ceased operations on September 21, 1997.
 Royal acquired Canair Cargo, which had 5 B737 freighter aircraft of which 3 were modified for

 Royal acquired Canair Cargo, which had 5 B/37 freighter aircraπ of which 3 were modified to passenger charter services.

6. Vistajet doubled its B737 fleet in August before ceasing operations on September 21, 1997.

Source: Carriers' Websites, JP Airline-Fleets International, 97-98

# **Interim US Airspace Fees**

In May, the US Federal Aviation Administration (FAA) announced that interim fees for airlines flying over US territory or through US-controlled airspace would begin in June. The Air Transport Association of Canada (ATAC) calculated that the fees would cost Canadian carriers some \$50 million per year. The Canadian government, reflecting the concerns of Canadian air carriers on the high cost and short notice of the fees, requested that formal consultations take place with the US government in an effort to delay the fees until the problems could be resolved. When the US government declined to make any changes, ATAC challenged the fees in US Superior Court on behalf of Canadian air carriers.1

## **Anti-Trust Immunity**

In June, the US Department of Transportation granted anti-trust immunity to Air Canada and United Airlines, allowing them to better co-ordinate the services they offer to the public. This anti-trust immunity is similar to that granted to Canadian Airlines International and American Airlines in 1996.

### **Code-Sharing**

In November, Canada and the US came to a negotiated agreement on "third country codesharing". Under code-sharing agreements, passengers are ticketed under one airline but travel on another airline sharing the code of the ticketing carrier. The Canada–US agreement permits Canadian air carriers, for example, to co-ordinate flights with their foreign partner airlines by code-sharing on flights between

Canada and the foreign country that go to, from or through the US. This will allow Canadian airlines to better integrate their transborder and international networks with those of their alliance partners. US carriers received reciprocal rights,

# MULTILATERAL INITIATIVES

# International Civil Aviation Organization

As host country to the International Civil Aviation Organization (ICAO), located in Montreal, and as a permanent member of the Council, Canada was active in all aspects of the work of this organization. Aviation safety and security were ICAO's chief areas of concern and study in 1997, with work continuing on the economic regulation of international air carriers, the environmental impacts of aviation emissions, and the legal liability of international air carriers concerning passengers and cargo.

# Asia Pacific Economic Cooperation

In June 1997, Canada hosted the meeting of the transportation ministers of the Asia Pacific Economic Co-operation (APEC). At that meeting, the Group on More Competitive Air Services was reactivated and tasked with prioritizing and examining:

- air carrier ownership and control.
- · tariffs.
- · doing business matters,
- · air freight,
- · multiple airline designation,
- · charter services,
- airlines' co-operative arrangements, and
- market access.

<sup>1</sup> In February 1998, the US Superior Court determined that the fees were invalid as calculated and ordered them discontinued. ATAC is seeking reimbursements of payments made by Canadian carriers.

A report for submission to APEC's transportation ministers is to be prepared by mid-1998.

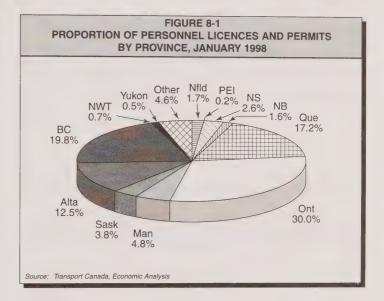
# INDUSTRY STRUCTURE

Canada's commercial air service industry continues to be dominated by Air Canada and Canadian Airlines International and their respective corporate and commercial affiliates. These two carriers offer domestic, transborder and international services, in competition with each other and with other domestic and foreign carriers.

A second tier of Canadian carriers - Air Transat, Canada 3000, Royal Aviation and Sky Service – offers transcontinental, international and inter-regional long-haul services year round. The primary activity of these carriers is to provide air transportation to tour operators that sell air-only and packaged travel (combined with lodging, meals, etc.) designed to meet the needs of the leisure traveller. The activity of these carriers tends to shift seasonally to the areas of greatest demand: Europe in the summer months, and the United States, the Caribbean and Latin America in the winter months.

For a time in 1997, three additional carriers offered services with jet aircraft in the domestic market: Greyhound Air (operated by Kelowna Flightcraft Charter Ltd.), Vistajet and WestJet. After both Greyhound Air and Vistajet withdrew from service in September, there remained only WestJet, which operates a fleet of six aircraft between cities in Western Canada.

TABLE 8-3 LICENCE AUTHORITIES HELD IN 1997									
Carrier Nationality:	US	Other Foreign							
Туре:	Small	Medium	Large	All-Cargo		- and a crongin			
Classification Domestic	864	29	14	29					
International Scheduled	10	26	67	3	65	47			
Non-Scheduled	398	24	15	23	767	73			
Total Type	1,272	79	96	55	832	120			
Total		1,	832	120					
Source: Canadian Transportation Agency									



There are a number of smaller carriers that operate in all regions of the country and that offer passenger and cargo services, as well as dedicated courier and on-demand charter services.

Canada has an active helicopter industry offering various general and specialized services throughout the country. In the general aviation sector, there is also business aircraft and a large recreational aviation community. There are flying schools in all parts of the country.

Table 8-2 lists aircraft of selected Canadian carriers in passenger services.

Table 8-3 provides the number of Canadian air licences held by carriers in 1997, broken down by carrier's nationality.

Figure 8-1 lists air personnel licences and permits by province.

# TABLE 8-4 DOMESTIC PASSENGER TRAFFIC – TOP 20 CITY-PAIRS SCHEDULED vs. CHARTER SERVICES 1996

Rai ##	nk* City pair	Scheduled Passengers	Charter Passengers	Total Passengers	Charter Share (%)
1	Montreal – Toronto	1.256.910	48.456	1,305,366	3.7
2	Toronto – Vancouver	821,650	238,504	1,060,154	22.5
3	Ottawa – Toronto	665,560	423	665,983	0.1
4	Calgary - Vancouver	578,320	69,515	647,835	10.7
5	Calgary - Toronto	462,500	88,313	550,813	16.0
6	Calgary - Edmonton	373,070	1,398	374,468	0.4
7	Toronto – Winnipeg	329,570	131,558	461,128	28.5
8	Edmonton - Vancouver	323,390	67,174	390,564	17.2
9	Halifax – Toronto	291,380	92,521	383,901	24.1
10	Edmonton - Toronto	263,830	48,753	312,583	15.6
11	Montreal - Vancouver	195,860	84,927	280,787	30.2
12	Vancouver - Winnipeg	174,980	118,256	293,236	40.3
13	Ottawa – Vancouver	169,380	16,999	186,379	9.1
14	Calgary - Winnipeg	162,670	78,221	240,891	32.5
15	Thunder Bay – Toronto	157,990	8,938	166,928	5.4
16	Prince George – Vancouver	122,330	801	123,131	0.7
17	Calgary - Montreal	121,920	11,307	133,227	8.5
18	St. John's - Toronto	121,720	45,602	167,322	27.3
19	Kelowna - Vancouver	121,650	1,966	123,616	1.6
20	Halifax - Ottawa	107,840	69	107,909	0.1

<sup>\*</sup> Ranking is based on scheduled origin/destination traffic, excluding charter origin/destination traffic. Source: Statistics Canada, Cat. 51-204 & 51-207.

# TABLE 8-5 DOMESTIC SECTOR ENPLANED AND DEPLANED PASSENGERS 1988 – 1996

(Thousands of passengers)						
Year						
1996						
1995						
1994						
1993						
1992						
1991						
1990						
1989						
1988						
Source: Statistics Canada, Cat. 51-203						

# AIR SERVICES

# DOMESTIC MARKET

## Changes

In September 1997, Kelowna Flightcraft ceased operating on behalf of "Greyhound Air" between Vancouver, Kelowna, Calgary, Edmonton, Winnipeg, Hamilton, Toronto and Ottawa. Laidlaw Transportation Inc. made the decision to withdraw from air services as a condition of purchasing Greyhound Canada Transportation Inc. Greyhound's air services were in operation for a total of 15 months.

A new discount carrier, Vistajet, entered the market in 1997 using a Boeing 737 aircraft between Toronto, Ottawa, Windsor and Thunder Bay, and later Winnipeg and Calgary. Service began in April and continued until the company ceased operations in September.

Canadian Airlines introduced the 55-seat Fokker F-28 in the Toronto-Ottawa-Montreal market on some flights, previously served with 100-seat Boeing 737s. The 737s were reassigned to serve the Western Canada triangle of Vancouver, Calgary and Edmonton and transborder services. This move was part of a general redeployment of its fleet in the airline's four-year recovery strategy announced for the period 1997-2000. Canadian Airlines also transferred some services to its regional affiliates.

### Other Airlines

In its second year of operation, WestJet, a Calgary-based discount carrier operating Boeing 737 aircraft, continued to limit its services to markets with flights lasting less than two hours. To the seven cities it was serving in 1996 (Calgary, Edmonton, Vancouver, Victoria, Kelowna, Regina and Saskatoon), WestJet added Abbotsford and, for a time, Winnipeg.

In addition to Air Canada and Canadian Airlines International, transcontinental services continued to be offered by Air Transat, Canada 3000 and Royal Aviation.

The only carriers to offer integrated services throughout all of Canada are Air Canada and Canadian Airlines International, which do this through a combination of their own services, those of regional affiliates and subsidiaries, and commercial agreements to code-share with a limited number of small independent carriers.

Preliminary statistics suggest that domestic passenger traffic increased by nine per cent in 1997 over 1996. Table 8-4 lists the top 20 domestic scheduled and charter-serviced markets for 1996.

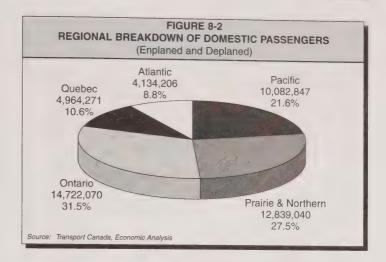
Table 8-5 shows the changes in domestic enplaned and deplaned passenger traffic between 1988 and 1996.

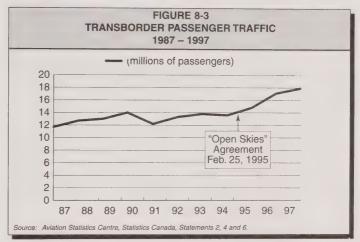
### **Regional Services**

Scheduled passenger and cargo services are provided in all regions, including Northern Canada, by the regional affiliates and subsidiaries of Air Canada and Canadian Airlines International and by a number of independent air carriers. With some notable exceptions, services are provided with turboprop aircraft.

Figure 8-2 shows the regional breakdown of domestic passenger (enplaned and deplaned) traffic.

A significant portion of intraregional air services was provided





by the regional affiliates/ subsidiaries of Canadian Airlines International and Air Canada. In a number of markets, services were transferred from the regional affiliates of the major carriers to smaller operators. Examples include transfers from Air BC to Central Mountain Air, Canadian Regional to Air Georgian, Air Alliance to Aviation Quebec Labrador; Inter-Canadien to Régionair.

Intra-regional air services were also provided to major population centres by WestJet (serving Western Canada and B.C.) and Vistajet (serving several points in Central Canada from April until it ceased operation in September).

Newfoundland and Labrador were additionally served by Inter Provincial Airways; while Air Inuit and First Air (including Air Creebec) and a number of smaller operators also provided air services within Quebec.

The major communities in Northern Canada are served by Canadian Airlines International and Air Canada through their regional affiliates and commercial partners

# TABLE 8-6 NEW AIR SERVICES IN TRANSBORDER MARKETS

Calgary - Chicago Canadian Calgary - Los Angeles Canadian Halifax - Boston Delta/Business Express Kenora - Ely/Minneapolis Northwest/Mesaba Montreal - San Francisco Air Canada Air Canada/Air Nova Ottawa - Boston Ottawa - New York La Guardia Delta/Business Express Ottawa - Philadelphia **US Airways** Air Canada Toronto - Charlotte Toronto - Columbus US Airways/ US Airways Express Air Canada Toronto - Cincinnati Toronto - Cleveland Continental/Continental Express Air Canada Toronto - Dallas/Ft. Worth Canadian Toronto - Dallas Ft. Worth Toronto - Houston Continental Toronto - Milwaukee Air Canada Toronto - Minneapolis Northwest Toronto - Phoenix Air Canada Toronto - Pittsburgh Air Canada Toronto - Providence, RI Air Canada/Air Ontario Toronto - Raleigh/Durham Canadian/Canadian Regional Air Canada/Air Ontario Toronto - Richmond Toronto - Seattle Air Canada Vancouver - Boston Canadian Vancouver - Dallas/Ft. Worth Canadian Vancouver - Houston Continental Vancouver - Las Vegas Alaska Airlines Vancouver - Los Angeles Alaska Airlines Vancouver - Phoenix Alaska Airlines Vancouver - San Francisco Alaska Airlines Vancouver - San Diego Canadian Alaska Airlines/ERA Aviation Whitehorse - Anchorage

and by a number of independent air carriers which also serve smaller points: operating from Yellowknife, Norman Wells and Inuvik serving the Western Arctic region were Aklak Air Ltd, North-Wright Air Ltd., Buffalo Airways Ltd., Air Tindi Ltd. and Northwestern Air Lease Ltd.; operating from Arviat and Rankin Inlet serving the Central Arctic region were Calm Air and Keewatin Air; operating from Igaluit serving the Eastern Arctic region were First Air and Baffin Air.

Services were affected during the first quarter of 1997 by a nine-week strike by pilots of Air Canada's regional affiliates (Air BC, Air Ontario, Air Alliance and Air Nova).

# TRANSBORDER MARKET

## **Air Services**

The number of air services in the transborder market continued to increase during 1997. Thirty-two transborder markets received new air services, bringing the total of new scheduled services to 107 since the signing of the "Open Skies" Agreement in February 1995.

# TABLE 8-7 TRANSBORDER PASSENGER TRAFFIC FOR SCHEDULED, REGIONAL AND CHARTER OPERATIONS 1991 – 1996

Period	od Canadian Carriers		US Ca	rriers	All Carriers	
	Passengers	% Market Share	Passengers	% Market Share	Passengers	% Annual Change
1991	5,182,000	42.3	7,057,000	57.7	12,239,000	
1992	5,619,000	42.2	7,688,000	57.8	13,307,000	8.7
1993	5,634,000	40.9	8,146,000	59.1	13,780,000	3.6
1994	5,908,000	43.3	7,735,000	56.7	13,643,000	-1.0
1995	6,482,000	43.7	8,367,000	56.3	14,849,000	8.8
1996	7,654,000	44.7	9,474,000	55.3	17,086,000	15.1

Notes: Some missing data estimated by Transport Canada Fourth quarter 1996 data estimated for US carriers

Source: Transport Canada, Air Policy

Excludes passengers carried by non-Canadian and non-US carriers

Source: Aviation Statistics Centre, Statistics Canada, Statements 2, 4 and 6

Transborder traffic is expected to have increased by five per cent over 1996. A key to this growth was the end of the two-year restriction on US air carriers from flying to Vancouver and Montreal, which was part of the 1995 deal. The last restriction on US carriers to full access to Toronto continued in effect until February 1998.

Figure 8-3 shows traffic growth over the past 10 years. Table 8-6 lists new air services in transborder markets, and Table 8-7 summarizes the passenger traffic for scheduled, regional and charter operations, as well as the market shares held by Canadian and US air carriers. Annexes 8-1 and 8-2 show this market's entry, exit and ongoing activity in services by air carrier nationality and points served.

#### Number of Seats

The number of seats flown in the transborder market is now running about 36 per cent above levels existing before the "Open Skies" Agreement. The two major Canadian carriers contributed to the increase in transborder capacity in 1997 when Canadian Airlines International redeployed some of its domestic fleet for its transborder services, and Air Canada expanded its transborder services using the CRJ Regional Jet aircraft and some larger aircraft. Figure 8-4 shows the scheduled services capacity in this market but does not include that of charter air services, nearly all of which was provided by Canadian air carriers.

#### INTERNATIONAL MARKET

### Air Services

Several changes took place during the year to international air services:

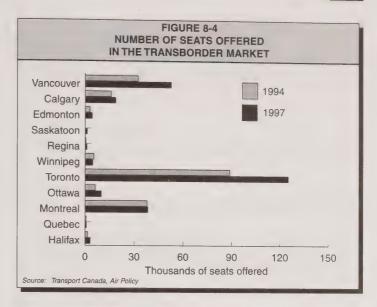


TABLE 8-8 INTERNATIONAL PASSENGER TRAFFIC 1991 – 1996									
	(Thousands of	passengers	)						
Sector Period Atlantic Pacific Southern Total									
1991	4,776	1,000	2,222	7,998					
1992	5,221	1,140	2,353	8,714					
1993	5,345	1,288	2,444	9,077					
1994	5,802	1,478	2,560	9,840					
1995	6,147	1,760	2,614	10,521					
1996	6,382	2,072	2,586	11,040					
	% Ch	ange							
1991-92	9.3	14.0	5.9	9.0					
1992-93	2.4	13.0	3.9	4.2					
1993-94	8.6	14.8	3.9	8.2					
1994-95	6.0	19.1	3.0	7.2					
1995-96	3.8	17.7	-1.1	4.9					

- In May, Canadian Airlines
   International announced code-shared air services over Miami to El Salvador and Guatemala with its partner, American Airlines.
- In May, Air Canada launched its trans-Pacific scheduled air service between Toronto and Osaka, Japan.
- In July, Air Canada began service to Ukraine on a codeshare.
- In the summer, Mexicana began scheduled service between Toronto and Mexico City.
- In the summer, Lacsa began service between Toronto and San Jose via Havana.

# TABLE 8-9 MARKETING ALLIANCES OF CANADA'S MAJOR AIR CARRIERS

Air Canada (STAR Alliance)

Lufthansa German Airlines Scandinavian Airlines System Thai Airways International United Airlines VARIG Brazilian Airlines

Canadian Airlines International (AA/BA Alliance)

American Airlines British Airways Qantas Japan Airlines

Source: Carrier Internet web sites

# TABLE 8-10 PARTICIPATION OF CANADIAN AIR CARRIERS IN TRANSBORDER COURIER OPERATIONS

US Courier Company

Airborne Express Burlington Express DHL

Emery Air Freight Corp. Federal Express T.N.T.

United Parcel Service

Source: Transport Canada Survey, November 1997

Canadian Operator providing feed to US Hub

Knighthawk Air Express
All Canada Express
Royal/CanAir Cargo
Bradley Air Services
Kelowna Flightcraft Air Charter Ltd.
Knighthawk Air Express
Western Express Airline

TABLE 8-11
VALUE OF CANADIAN INTERNATIONAL TRADE'S AIR SHARE
1996

(Millions of dollars)

illions of do	iidi3)	
Air	All modes	Air's Share (%)
9,979	223,479	4.5
14,443	157,494	9.2
24,422	380,973	6.4
8,231	50,305	16.4
15,340	75,620	20.3
23,571	125,925	18.7
	9,979 14,443 24,422 8,231 15,340	9,979 223,479 14,443 157,494 <b>24,422 380,973</b> 8,231 50,305 15,340 75,620

- \* Exports to other countries include domestic exports only (Re-exports excluded).
- Note: For exports, mode of transport means the mode by which the international boundary is crossed. For imports, the mode of transport represents the last mode by which the cargo was transported to the port of clearance in Canada; this may not be the mode of transport by which the cargo arrived at the Canadian port of entry in the case of inland clearance. This led to some underestimation of Canadian imports by the marine and air transport modes.

Source: Statistics Canada, Cat. 65-202 and 65-203; Special tabulations for the US.

- In September, the vast majority of international air services at Montreal were relocated to the Dorval terminal from Mirabel.
- In October, Royal Jordanian Airlines terminated service to/from Canada.
- In October, Air India suspended flights to Toronto.

Although Mirabel International
Airport was designated for charter
air services as of September, two
air carriers were still operating
scheduled air services from there at
year-end. These were Cubana, with
twice-weekly air services to
Havana, and Air Transat, which
began its first scheduled air services
to France with twice-weekly flights
to Paris through Charles de Gaulle
Airport.

Preliminary statistics indicate a nine per cent increase in passenger traffic in 1997 over 1996. In 1996, total traffic increased 4.9 per cent over 1995 levels. Table 8-8 shows international passenger traffic from 1991 to 1996, including both passenger traffic carried on sameplane air services between Canada and countries other than the US, and passenger traffic carried on scheduled, charter and regional air services. The figures exclude passengers connecting to international air services in the US.

### **Marketing Alliances**

During 1997, Canada's two international scheduled air carriers continued to use marketing alliances to extend or reinforce their presence in international markets where they would not otherwise provide direct service. In a marketing alliance, air carriers co-ordinate their scheduling, marketing and product distribution and each carrier can sell tickets on the entire system, including the points they do not serve, by linking with other partners through

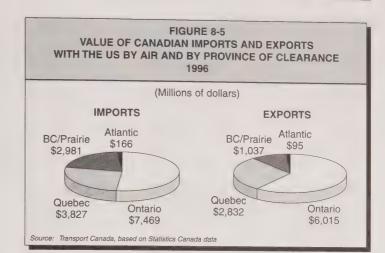
code-sharing. As a result, competition is increasingly occurring between groups of air carriers operating within a marketing alliance. Table 8-9 shows the participation of Canada's airlines in marketing alliances.

Annex 8-3 lists the international air services provided to and from Canada as of the end of 1997. These include foreign markets served by Air Canada and Canadian Airlines International, as well as Canadian markets served by foreign air carriers. This appendix also provides a partial listing of foreign markets served by Canada's charter air carriers. It shows that there are 42 countries currently receiving same-plane, scheduled air services from Canada. Canadian air carriers serve 29 of these countries.

# Air Cargo

The booking of cargo frequently involves an intermediary such as a cargo agent, freight forwarder or consolidator. Cargo agents are retailers who sell cargo transportation to shippers on behalf of a carrier, while freight forwarders and consolidators act on behalf of shippers as forwarding agents, or consolidate shipments from various shippers to take advantage of reduced freight rates.

Canadian airlines carry air cargo primarily in the belly of their passenger aircraft, which makes it an additional source of revenue for a relatively low incremental cost. A limited number of other carriers provide all-cargo capacity, and some of these are dedicated to contract carriage for the major North American courier companies.



All-cargo air services into
Canada are provided exclusively
by foreign air carriers, namely Air
France, Lufthansa, Cathay Pacific
Airways and Korean Air Lines.
Other foreign carriers provided
charter cargo services, notably
when specialized handling
equipment was required.

Table 8-10 shows the participation of Canadian air carriers in transborder courier operations. It should also be noted that a significant portion of cargo moving on air waybills is actually trucked between Canada and the US.

# AIR CARGO INTERNATIONAL TRADE

According to international trade data, the value of international freight handled at Canadian airports in 1996 was approximately \$48 billion (excluding shipments via US airports), with imports valued at \$30 billion and exports around \$18 billion (Table 8-11). Canada's main air trading partners are the US, the Western European nations (mainly the United Kingdom, France, Germany and Switzerland) and the Pacific Rim countries

(mainly Japan, South Korea and Taiwan).

#### Transborder Trade

Canada's trade with the US using air transportation services was \$24.4 billion in 1996, of which \$14.4 billion was imports. Main imported commodities were telecommunications equipment (\$3.0 billion or 21 per cent of total air value in trade by air from the US), electronic computers (\$2.8 billion or 20 per cent), transportation equipment (17 per cent) and other equipment (12 per cent).

Total Canadian exports by air to the US were valued at \$10 billion. Main commodities exported were aircraft equipment (\$2.2 billion or 22 per cent of total trade by air to the US), office machine equipment (19 per cent) and telecommunication equipment (15 per cent). Special transactions accounted for ten per cent of exports by air.

As illustrated in Figure 8-5, Ontario dominated (with a share of over 50 per cent) in both exports and imports, followed by Quebec and the Western provinces.

# TABLE 8-12 VALUE OF CANADIAN EXPORTS BY AIR MAIN DESTINATIONS\* 1996

Destinations	Value (\$ Million)	Share (%)
Western Europe	4,750	57.7
Germany	1,145	13.9
U.K.	1,101	13.4
Switzerland	704	8.5
France	628	7.6
Other	1,172	14.2
Pacific Rim	2,235	27.2
Japan	468	5.7
Hong Kong	407	4.9
South Korea	349	4.2
Other	1,011	12.3
Other countries	1,246	15.1
Total Canadian exports by air	8,231	

<sup>\*</sup> Excluding the US. Including domestic exports only (Re-exports excluded).

Source: Statistics Canada, Cat. 65-202 (Exports)

# TABLE 8-13 VALUE OF CANADIAN IMPORTS BY AIR MAIN COUNTRIES OF ORIGIN\* 1996

Origin	Value (\$ Million)	Share (%)
Western Europe	7,025	45.8
U.K.	1,707	11.1
France	1,378	9.0
Germany	1,069	7.0
Italy	726	4.7
Switzerland	514	3.3
Other	1,631	10.6
Pacific Rim	5,872	38.3
Japan	1,925	12.5
South Korea	894	5.8
Taiwan	661	4.3
Malaysia	573	3.7
Singapore	465	3.0
Other	1,354	8.8
Other countries	2,443	15.9
Total Canadian imports by air	15,340	

\* Excluding the US. Including domestic exports only (Re-exports excluded). Source: Statistics Canada, Cat. 65-203 (Imports)

#### **Trade With Other Countries**

Canada's trade with other countries using air transportation was comparable to the Canada/US air trade: total value was near \$24 billion and imports dominated at \$15.3 billion, while exports reached \$8.2 billion. Ontario and Quebec dominate Canadian air trade with overseas countries, Ontario having a share of over 55 per cent, and Quebec a share of 27 per cent.

As shown in Table 8-12, the main destinations for Canada's exports using air services were the Western European countries (\$4.7 billion or 58 per cent of total air exports to overseas) and the Pacific Rim countries (\$2.2 billion, a 27 per cent share). Commodities imported to Canada by air came from Western European countries (\$7.0 billion or 46 per cent of total air imports from overseas) and the Pacific Rim countries (\$5.9 billion or a 38 per cent share) (see Table 8-13).

# GENERAL AVIATION

The term "general aviation" describes all private-sector aviation other than air transport services, including flight training, specialty air services and business aviation. It represents 53 per cent of aircraft activity at airports with control towers although much of the activity is at non-towered airports. Another indicator of the size of the general aviation sector is the number of Transport Canada licences in effect. Table 8-14 shows aircraft movements at towered airports for 1992 to 1996. Table 8-15 shows personnel licences and permits issued in 1997.

TABLE 8-14  AIRCRAFT MOVEMENTS AT TOWERED AIRPORTS  1993 – 1997									
Year	Air Carrier	Other Commercial	Private	Government	Military	Total Itinerant	Local	Total	
1993	2,187,029	337,659	607,347	90,103	72,641	3,294,779	1.657.878	4,952,657	
1994	2,214,464	377,413	584,220	84,243	68,898	3,329,238	1.588.567	4,917,805	
1995	2,168,847	396,360	514,034	69,069	58,627	3,206,937	1,522,880	4,729,817	
1996	2,238,698	431,229	455,892	62,956	57,101	3,245,876	1,548,822	4,794,698	
1997	2,335,286	409,002	452,031	60,127	57,316	3,313,762	1,683,088	4,996,850	
Source:	Aircraft Movements	Statistics Annual Report, T	P577					, , , , , , , , , , , , , , , , , , , ,	

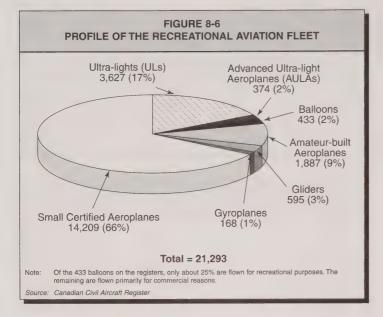
## SPECIALTY AIR SERVICES

Specialty air services provide many services that are vital to the Canadian economy. These include activities that provide direct support to Canadian industry, such as airborne fire-fighting, aerial inspection and construction services, and geophysical surveys. Specialty air services are the one segment of the aviation industry subject to the North American Free Trade Agreement.

### **BUSINESS AVIATION**

As part of business aviation, approximately 150 private operators use a fleet of some 230 privately owned and registered aircraft to provide their own businesses and joint ventures with an alternative to commercial air services. This sector is showing strong recovery from the downturn of the early 1990s, with reported hours of operation up by as much as 20 per cent. More than 850,000 passengers were carried by business aircraft during 1997. The growth in the industry was marked by an upgrading of the fleet, including the addition of longer range business jets, reflecting the increasing globalization of business activities.

TABLE 8-15									
SUMMARY OF PERSONNEL LICENCES									
AS OF JANUARY 1998									
In Issued									
	Force	in 1997	Male	Female					
Aeroplanes									
Private Pilots	30,108	2,914	28,347	1,761					
Commercial Pilots	8,452	1,072	8,009	443					
Airline Transport Pilots	10,083	748	9,824	259					
Total	48,643	4,734	46,180	2,463					
Helicopters									
Private Pilots	- 257	42	239	18					
Commercial Pilots	2,099	207	2,050	49					
Airline Transport Pilots	480	50	479	1					
Total	2,836	299	2,768	68					
Permits									
Glider Pilot	7,070	508	6,215	855					
Gyroplane Pilot	21	0	20	1					
Balloon Pilot	339	15	304	. 35					
Ultra-Light Pilot	2,846	211	2,774	72					
Recreational Pilot	756	430	711	45					
Total	11,032	1,164	10,024	1,008					
Other Licences									
Flight Navigators	N/A	N/A	N/A	N/A					
Flight Engineers	501	38	491	10					
Air Traffic Controllers	2,209	99	2,051	158					
Aircraft Maintenance	10,545	409	10,468	77					
Total	13,255	546	13,010	245					
Total Licences & Permits	75,766	6,743	71,982	3,784					
Source: Transport Canada Safety and Security									



## RECREATIONAL AVIATION

Recreational aviation is carried out by private-sector enthusiasts who participate primarily for the pleasure of flying. This group represents the biggest segment of civil aviation, with over two thirds of Canada's pilots (over 41,000) and three quarters of Canada's aircraft (over 22,000).

Consultations between Transport Canada and the recreational aviation community have resulted in the development of a national Recreational Aviation Policy, published in 1996, which covers such matters as:

- establishment of a recreational pilot permit,
- a streamlined process for aerobatics in amateur-built aircraft.
- an expanded definition of "ultra-light aeroplane",
- new provisions for owner maintenance,
- provisions for Instrument Flight Rules (IFR) operation of amateur-built aeroplanes,

- new licensing standards for ultra-light pilots, and
- discussions of a new "sport plane" category.

Figure 8-6 shows the profile of the recreational aviation fleet.

# PRICE AND OUTPUT CHANGES

Between the mid-1980s and the mid-1990s, domestic air passenger services were subject to price increases superior to the rate of inflation which caused demand to plummet significantly. However since renewed competition in the industry has led to a more extensive use of discount fares, as well as greater discounting of fares from the basic economy rates. This produced an effective reduction in domestic prices by 13 per cent between 1991 and 1996. The price performance over recent years within the domestic industry contributed to a recovery in demand for domestic air services, which

surged by 15.2 per cent in the two-year period 1995 – 1996. In the first half of 1997, the drop in domestic prices was of the order of three per cent. Demand continued to grow, increasing by ten per cent.

From 1992 to 1996, the price of all international air services showed no material change, but demand rose by 34 per cent. Over that period, the transborder market was Canada's most dynamic market despite price increases double those of the general inflation rate. Demand was stimulated by booming Canada–US trade activities and by the introduction of new services following the "Open Skies" Agreement. In spite of upward price pressure, demand for transborder services continued to be strong.

In other international markets, much of the increases in demand can be attributed to stimulation from lower prices as well as developing markets in Asia Pacific. Since 1991. the increased use of discount fares has contributed to the 20 per cent decline, in real terms, of the price of non-transborder international air services. In the first half of 1997. the price of all international services rose by 3.8 per cent, led by major increases in the price of transborder services. Despite these price pressures, demand for transborder and other international services continued to be strong, advancing in the first half of 1997 by 15 per cent.

Overall, between 1992 and 1996, output of the Canadian air transport industry advanced at a rate of five per cent a year, compared with 3.5 per cent for the economy.

Table 8-16 shows the price and output changes in the airline industry.

# Financial Performance

## REVENUES/EXPENSES

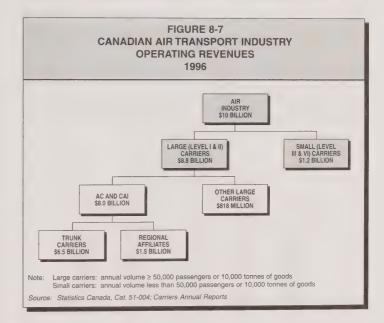
In 1996, total operating revenues of the Canadian air transport industry reached \$10 billion. Air Canada and Canadian Airlines combined, including their affiliates, generated \$8 billion, representing 80 per cent of the total. Other large carriers shared eight per cent of total industry revenues and the remaining 12 per cent was generated by smaller carriers (Figure 8-7).

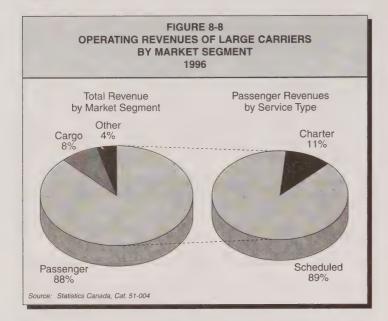
About 88 per cent of the industry's total operating revenues are from passenger transportation. Cargo accounts for eight per cent. The remaining four per cent is from other flying services and incidental air transport services related revenues (Figure 8-8).

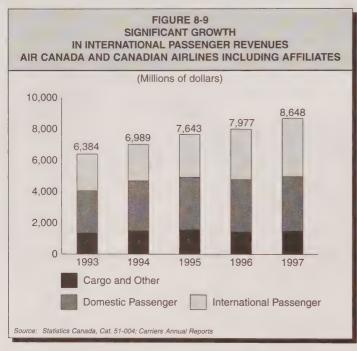
While charter services only contribute 11 per cent to larger carriers' total passenger and goods revenues, they generate about 88 per cent of the total revenues of smaller carriers. For the industry as a whole, about 80 per cent of air passenger and cargo transportation revenues are generated by scheduled services and 20 per cent by charter services.

In the period 1993 to 1997, total combined revenues of Air Canada and Canadian Airlines increased by 35 per cent. Domestic passenger revenues grew by 29 per cent, but were outperformed by the 57 per cent growth in international passenger revenues. Since the implementation of the Canada–US "Open Skies" Agreement in 1995, increases in carriers' new transborder routes and traffic contributed to a significant growth

#### **TABLE 8-16** PRICE AND OUTPUT CHANGES IN THE AIRLINE INDUSTRY 1994 - 1997 1994 1995 1996 19971 Price Changes (%) **Domestic Passenger Services** 2.7 (0.5)(6.7)(3.0)International Passenger Services 3.9 (0.9)(4.8)3.8 Air Freight Services 1.4 0.5 (3.6)0.2 Total Air Industry 3.2 (0.3)(5.1)0.5 **Business Economy** 1.42 2.8 3.5 1.9 Output Changes (%) Domestic Passenger Services 3.7 5.2 9.6 9.9 International Passenger Services 1.5 14.0 15.2 15.3 Air Freight Services 1.5 9.9 3.1 7.7 Total Air Industry 2.5 9.5 11.7 12.5 $3.8^{2}$ **Business Economy** 5.2 2.4 2.8 1 Based on first half of the year 2 Preliminary Source: Transport Canada, based on Statistics Canada files







in international revenues (Figure 8-9). Cargo and other revenues only grew by 11 per cent in the four-year period.

The industry average operating ratio (operating expenses over revenues) increased to 97.4 per cent in 1996, from 95.8 per cent in 1995, primarily due to higher fuel prices. With narrow operating profit margins, the financial performance of the air industry is sensitive to changes in input prices.

In 1996, the share of labour costs did not change with a 25 per cent share of industry revenues.2 Total fuel costs increased by \$215 million and fuel's share in total operating revenues increased to 16 per cent in 1996 from 14 per cent in 1995. Other operating expenses accounted for almost 60 per cent of operating revenues. Notable items are marketing (13 per cent), aircraft rents (seven per cent), depreciation (six per cent) and landing fees (three per cent), and food and beverage costs (between four and five per cent).

From 1990 to 1994, employment fell by 17 per cent, followed by a five per cent gain in 1995 and 1996. Labour productivity rose by 31 per cent between 1992 and 1996, much more than the six per cent increase of the business sector over that time. Canadian air carriers' unit labour costs increased significantly (18 per cent) between 1988 and 1992, but dropped by 13 per cent between 1992 and 1996.

<sup>2</sup> The relative importance of each factor input in the cost structure should be calculated in terms of total costs. But total costs include not only all operating costs, but also an allocation for the cost of capital. Measuring the cost of capital is a complex exercise and not all the information needed to measure it was available. Therefore total operating revenues were used in this report as a proxy for total costs under the assumption that net income is equivalent to the cost of capital.

Table 8-17 shows the cost structure and efficiency indicators in the airline industry.

Total factor productivity of the airline industry hit a low in 1991, at 15 per cent below 1986 levels. Since then, it has risen 4.5 per cent a year, with a strong performance in 1996 (8.2 per cent). Between 1991 and 1996, air transport industry unit costs have declined by 11 per cent, representing a cost reduction exceeding \$1 billion. In 1996 alone, the industry reduced its costs by some \$450 million.

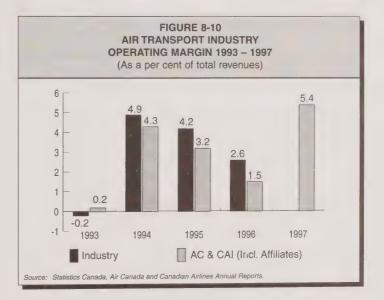
#### **PROFITABILITY**

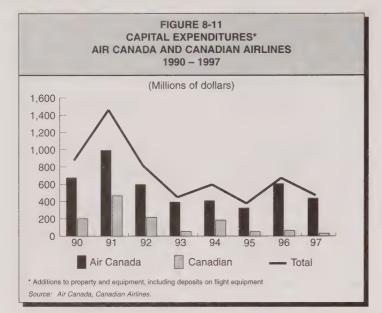
Although the profitability of the air industry improved in 1997 it has not fully recovered from substantial losses incurred in the early 1990s.

In 1996, the industry's financial performance was significantly affected by the operating losses of some large carriers; the average operating margin ratio dropped to 2.6 per cent from 4.2 per cent in 1995 (Figure 8-10). In order to improve profitability and remain viable, these under-performing airlines had to undertake major restructuring measures. Notably, Canadian Airlines has over the past year implemented a four-year operational restructuring plan; Royal Aviation also undertook a major restructuring in 1996 and has since improved its profitability.

In 1997, both Air Canada and Canadian Airlines (including their affiliates) showed improvements in operating profits.

#### **TABLE 8-17 COST STRUCTURE AND EFFICIENCY INDICATORS** IN THE AIRLINE INDUSTRY, 1993 - 1996 1993 1994 1995 1996 Cost Structure (In % of Op. Rev.) Labour 28.4 25.6 25.2 24.5 Fuel 14.5 14.2 14.3 15.9 Employees (in 000) 39.3 39.0 40.6 41.0 **Average Labour Cost** 46.3 46.3 48.4 49.7 per employee (\$000) Productivity Change (in %) Labour 2.9 7.7 6.1 11.1 Fuel (0.6)(6.4)0.0 4.0 Total 3.9 4.4 2.5 8.2 Unit Cost Change (in %) Labour 2.5 (7.2)(1.5)(7.6)Total (0.1)(2.6)1.2 (5.4)Source: Transport Canada, based on Statistics Canada files





#### **INVESTMENTS**

After committing large investments in 1991, total capital expenditures by the two main airlines dropped sharply in the following four years, due to life cycles of flight equipment, over capacity during recession, and poor financial results (Figure 8-11).

Air Canada reverted the downward trend in 1996 with a \$607 million investment in flight equipment and other properties. In 1997, combined total capital expenditures of Air Canada and Canadian Airlines amounted to \$471 million.

#### **ANNEX 8-1** STATUS OF TRANSBORDER SERVICES BY CARRIER NATIONALITY

	Oper	Service: rated S ruary 1	Since	Pre Service Since F		ended		ices Ad Since ruary 1		Servic Febr	es Ope as of ruary 1	
	Canada	US	Total	Canada	US	Total	Canada	US	Total	Canada	US	Total
Toronto/Pearson	14	23	37	1	11	12	29	12	41	42	24	66
Vancouver	6	10	16	-	6	6	8	15	23	14	19	33
Montréal/Dorval	7	10	17	-	3	3	3	5	8	10	12	22
Calgary	4	5	9	2	3	5	4	5	9	6	7	13
Ottawa	1	6	7	sin .	4	4	3	5	8	4	7	11
Halifax	2	-	2	-	-	-	1	2	3	3	2	5
Edmonton		3	3	-	1	1	-	1	1	-	3	3
Winnipeg	1	1	2	-	-	-	-	-	-	1	1	2
Others	5	8	13	3	2	5	-	4	4	2	10	12
Total scheduled	40	66	106	6	30	36	48	49	97	82	85	167
Charter conversions	30	-	30	20	-	20	-	-	-	10	-	10
Grand total	70	66	136	26	30	56	48	49	97	92	85	177

Notes: - Includes only those services operated by major carriers and their regional affiliates.
- Includes service changes planned for the winter and spring of 1998.
- Excludes services services added since February 1995 but subsequently suspended.
- Charter conversions are defined as charter services operated by Air Canada and Canadian Airlines prior to February 1995 but were later converted to scheduled flights.
- Charter services not included unless converted to scheduled services in 1995/96.

Source: Transport Canada, Air Policy

	STATU	ANNEX 8-2 US OF TRANSBORDER A AS OF FEBRUARY 24,		
Airport	Current Services Introduced After February 24, 1995	Current Services Operated Before February 24, 1995	Pre-Agreement Services Suspended after February 24, 1995	New Services Subsequently Suspended
Calgary	Chicago: American Chicago: Canadian*** Denver: United Houston: Air Canada Los Angeles: Canadian Minneapolis: Northwest San Francisco: United Seattle: Alaska (R) Spokane: Air Canada (R)	Dallas: American Los Angeles: Air Canada Sait Lake City: Delta San Francisco: Air Canada	Chicago: Air Canada Denver: Delta Los Angeles: Delta New York/Newark: Air Canada Spokane: United	Chicago: Canadian Denver: Air Canada Las Vegas: Canadian (C) Las Vegas: Delta Palm Springs: Canadian (C) Phoenix: Canadian (C)
Edmonton Intl.	Seattle: Alaska (R)	Minneapolis: Northwest Salt Lake City: Delta	Dallas: American	Las Vegas: Canadian (C)
Fredericton				Boston: Air Canada (R)
Halifax	Boston: Canadian (R) Boston: Delta (R) New York/Newark: Continental (R) Orlando: Air Canada (C)***	Boston: Air Canada (R) New York/Newark: Air Canada (R)		Detroit: Northwest Ft. Lauderdale: Canadian (C) New York/Kennedy: American (R) Orlando: Canadian (C) St. Petersburg: Canadian (C) Tampa: Air Canada (C)
Hamilton		Pittsburgh: US Airways (R)		
Kenora	Minneapolis: Northwest (R)***			
London		Detroit: Northwest (R) Pittsburgh: US Airways (R)		
Moncton				Boston: Air Canada (R) Boston: Delta (R)
Montréal/Dorval	Atlanta: Delta Ft. Lauderdale: Air Canada (C) Harfford: Air Canada (R) Miami: American Minneapolis: Northwest New York/Kennedy: American (R) New York/Newark: Continental Orlando: Air Canada (C)*** San Francisco: Air Canada Washington/National: Air Canada	Boston: Air Canada Boston: Delta (R) Chicago: Air Canada Chicago: Air Canada Chicago: Armerican Cincinnati: Delta Detroit: Northwest Los Angeles: Air Canada Miami: Air Canada New York/LaGuardia: Air Canada New York/LaGuardia: Delta (R) New York/Newark: Air Canada Philadelphia: US Airways Tampa: Air Canada***	Baltimore: US Airways Hartford: Delta (R) Miami: Delta	Atlanta: Air Canada Boston: USAir Shuttle Dallas: American New York/Kennedy: Delta New York/LaGuardia: USAir Shuttle Philadelphia: Air Canada (R) Washington/Dulles: ValuJet Washington/National: US Airways
Montréal/Mirabel			Boston: Northwest (R)	
Ottawa	Boston: Air Canada (R) Chicago: Air Canada Chicago: American Detroit: Northwest (R) New York/LaGuardia: Delta (R) New York/LaGuardia: Ontinental (R)* Philadeliphia: US Airways Washington/Dulles: Air Canada	Boston: Delta (R) New York/Newark: Air Canada Pittsburgh: US Airways (R)	Albany: Delta (R) Baltimore: US Airways New York/Kennedy: US Airways (R) Syracuse: US Airways (R)	New York/Kennedy: American (R) Orlando: Canadian (C) St. Petersburg: Canadian (C)
Québec		Boston: Delta (R) New York/Newark: Air Canada (R)		New York/Kennedy: American (R)
Regina	Minneapolis: Northwest (R)		Minneapolis: Canadian (R)	
Saint John		Boston: Canadian (R)	New York/Newark: Air Canada (R)	Boston: Delta (R)
Saskatoon	Minneapolis: Northwest			
Thunder Bay		Minneapolis: Northwest (R)		
Toronto/Pearson	Allentown: Air Canada (R) Allanta: Air Canada Allanta: Delta Boston: Canadian* Boston: Delta (R) Charlotte: Air Canada Charlotte: US Airways (R) Chicago: Canadian Cincinnati: Air Canada Cleveland: Continental (R) Columbus: Air Canada (R) Columbus: US Airways (R) Dallas: Air Canada	Baltimore: Air Canada (R) Baltimore: US Airways (R) Boston: Air Canada Chicago: Air Canada Chicago: American Chicago: United Cincinnati: Delta (R) Cleveland: Air Canada Dallas: American Dayton: US Airways (R) Detroit: Northwest Grand Rapids: Midwest Express (R) Hartford: Air Canada (R)	Albany: Delta(R) Boston: US Airways Cleveland: US Airways (R) Hartford: Delta (R) Miami: Delta Nashville: American Pittsburgh: Delta Rochester: US Airways Syracuse: Delta (R) Tampa: Delta Washington/Dulles: Canadian (R) Washington/Dulles: Delta (R)	Ft. Lauderdale: Canadian (C) Ft. Myers: Canadian (C) Indianapolis: Air Canada (R) Nashville: Delta (R) Saginaw: Midwest Express (R) St. Petersburg: Canadian (C) Sarasota: Canadian (C) Tampa: American Tampa: Canadian Washington/National: US Airways West Palm Beach: Canadian (C)
				Continued

Airport	Current Services Introduced After	Current Services Operated Before	Pre-Agreement Services Suspended	New Services Subsequently
Toronto/Pearson (continuation)	Dallas: Canadian Denver. Air Canada T: Lauderdale: Air Canada (C)*** Ft. Myers: Air Canada (C)*** Harrisburg: Air Canada (C)*** Harrisburg: Air Canada (R) Houston: Continental Kansas City: Air Canada Las Vegas: Air Canada (C) Miami: American Miami: Canadian Miiwaukee: Air Canada Miimaukee: Air Canada Miimaukee: Midwest Express Minneapolis: Northwest Nashville: Air Canada New York/LaGuardia: Canadian New York/LaGuardia: Canada Pitsburgh: Air Canada Pittsburgh: US Air Canada Pittsburgh: US Airways Providence: Air Canada Pittsburgh: US Airways Providence: Air Canada Raleigh: Canadian (R) Richmond: Air Canada Raleigh: Canadian (R) St. Louis: Air Canada St. Louis: Air Canada Washington/Dulles: Air Canada	February 24, 1995  Honolulu: Canadian Houston: Air Canada Indianapolis: US Ainways (R) Los Angeles: Air Canada Miami: Air Canada New York/LaGuardia: Air Canada New York/LaGuardia: Air Canada New York/LaGuardia: Air Canada Philadelphia: US Ainways San Francisco: Air Canada San Francisco: United Tampa: Air Canada	after February 24, 1995	Suspended
Vancouver	Boston: Canadian Chicago: Canadian Dallas: American Dallas: Canadian Denver: United Detroit: Northwest*** Honolulu: Air Canada (C) Houston: Continental Kahului/Maui: Air Canada (C) Las Vegas: Alaska Las Vegas: Alaska Las Vegas: Alaska Los Angeles: Air Canada Los Angeles: Air Canada Los Angeles: Horited Minneapolis: Northwest New York/Kennedy: American Phoenix: Alaska Phoenix: Alaska Phoenix: America West Portland: Canadian (R) Reno Air Salt Lake City: Delta (R) San Diego: Canadian San Francisco: Air Canada San Francisco: Alited	Chicago: United Honolulu: Canadian Los Angeles: Canadian Portland: Air Canada (R) Portland: Alaska (R) Portland: Delta (R) San Francisco: Canadian Seattle: Air Canada (R) Seattle: Air Canada (R) Seattle: Canadian (R)	Bellingham: Alaska (R) Los Angeles: Delta San Francisco: Delta San Jose: American Seattle: United Spokane: Northwest	Atlanta: Delta* Cincinnati: Delta Denver: Air Canada Las Vegas: America West Miami: American New York/Newark: Continent Palm Springs: Canadian (C) Reno: Canadian (C) San Diego: Alaska
Victoria		Seattle: Alaska (R)	Port Angeles: Alaska (R)	
Whitehorse	Anchorage: Alaska (R)	Chicago, Air Conodo		Chicago: American
Winnipeg		Chicago: Air Canada Minneapolis: Northwest		Las Vegas: Canadian (C) Orlando: Air Canada (C) Palm Springs: Canadian (C)

\*\*- Indicates service beginning in April 1998
\*\*\*- Seasonal service

Source: Transport Canada, Air Policy.

(C)- Denotes charter services operated by Air Canada and Canadian Airlines before February 24, 1995

ANNEX 8-3
STATUS OF INTERNATIONAL AIR SERVICES 14
AS OF FEBRUARY 24, 1998

		AS OF FEBRUA	ARY 24, 1998	
	Foreign points served by		Canadian points served	Major charter
Atlantic	Air Canada  Delhi	Canadian Airlines London	by foreign air carriers  Aeroflot: Montreal	Amsterdam
	Frankfurt Glasgow London Manchester Paris Tel Aviv Zurich	Rome .	Air France: Montreal, Toronto Alitalia: Toronto 3 British Ainways: Toronto, Vancouver Czech Airlines: Montreal, Toronto El Al: Montreal, Toronto Iberia: Montreal Icelandair: Halifax KLM: Montreal, Toronto, Vancouver Lufthansa: Toronto, Vancouver Olympic: Montreal, Toronto Pakistan International: Toronto Royal Air Maroc: Montreal Swissair: Montreal	Frankfurt Glasgow London Manchester Paris
Pacific	Hong Kong Osaka Seoul	Auckland Bangkok Beijing Hong Kong Manila Nagoya Taipei Tokyo	Air China: Vancouver Air New Zealand: Vancouver Cathay Pacific: Toronto, Vancouver Japan Airlines: Vancouver Korean Air: Toronto, Vancouver Malaysia Airlines: Vancouver Mandarin: Vancouver Philippine Airlines: Vancouver Singapore Airlines: Vancouver	None
Southern	Antigua Barbados Bermuda Fort-de-France Kingston Montego Bay Nassau Pointe-a-Pitre Port-au-Prince Port of Spain St. Lucia	Buenos Aires Mexico City Monterrey Sao Paulo	BWIA: Toronto Cubana: Montreal, Toronto LACSA: Toronto Mexicana: Montreal, Toronto VASP: Toronto	Acapulco Cancun Ixtapa Montego Bay Nassau Puerto Plata Puerto Vallarta Punta Cana Santo Domingo Varadero
Other	Air Transat: Paris First Air: Kangerlussuaq		Air St-Pierre: Halifax, Montreal, St. John's, Sydney Greenlandair: Iqaluit <sup>3</sup>	

Source: Transport Canada, Air Policy

Notes: 1- Includes only "own-equipment" services and excludes code-shares.
2- Includes foreign destinations with more than 50,000 charter passengers in 1996.
3- Services provided only during the summer months.
4- Scheduled services include only those services for which there is a generally available published schedule. There are instances where international services are provided under a schedule that is not published such as Air Transat's service to Cuba.

# MARINE

In 1997, some significant marine legislative changes were proposed and a number of important events related to infrastructure and services took place.

Canada's marine transportation sector includes a domestic fleet of operators providing domestic and transborder shipping services, as well as an international marine trade calling at major ports for import and export traffic overseas. The sector also includes a network of ferry services throughout the country and a host of cruise ship operators of varying sizes that offer services in different markets across Canada.

### Major Events in 1997

# LEGISLATIVE AND REGULATORY FRAMEWORK Canada Marine Act (Bill C-9)

In October 1997, Bill C-9, the *Canada Marine Act* (CMA) was introduced in the House of Commons. This legislation contains the same provisions as the earlier Bill C-44, which did not complete the parliamentary process prior to the dissolution of Parliament on April 27, 1997 for the federal election.

The main objective of the legislation is to implement the 1995 National Marine Policy, making it easier for ports and other marine services and facilities to operate according to business principles. The policy includes dissolution of the Canada Ports Corporation; creation of not-for-profit Canada Port Authorities; divestiture of regional and local ports; management of the St. Lawrence Seaway by user interests; commercialization of ferry services; and the modernization of marine pilotage.

The Bill was passed by the House of Commons on December 9, 1997 and referred to the Senate.

# Amendments to the *Canada* Shipping Act (Bill S-4)

Bill S-4, an Act to amend the Canada Shipping Act, was introduced in the Senate in October 1997. The amendments were originally introduced in September 1996, but did not complete the parliamentary process prior to the dissolution of Parliament in April 1997. Bill S-4 will increase the amount of compensation available to private and public claimants for maritime claims in general, and for oil pollution damage in particular. The Bill was passed by the Senate on December 16, 1997. It was introduced in the House of Commons on February 11, 1998 and received second reading on February 23, 1998.

The Canada Shipping Act deals with the activities of foreign ships in Canadian waters. It covers issues such as ship registration; licensing of masters and crew; ship safety; wrecks; salvage and casualty investigations; light stations and other aids to navigation; port wardens; collisions and liability; delivery of goods; ship-source pollution; and compensation for pollution.

# Convention on Limitation of Liability for Maritime Claims

In September 1997, Canada signed the Protocol to amend the 1976 Convention on Limitation of Liability for Maritime Claims, adopted in May 1996 under the auspices of the International Maritime Organization (IMO). Provisions of this Protocol are to be implemented through the amendments to the *Canada Shipping Act* proposed in Bill S-4. Canada's ratification of the Protocol is to take place once the Bill is passed.

#### Carriage of Hazardous and Noxious Substances by Sea (HNS Convention)

In September 1997, Canada also signed the new International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, adopted in May 1996 under the auspices of the IMO.

The new convention contains a shared liability system, with the first tier covered by shipowners and the second financed by cargo interests. It will provide compensation for damage, including contamination of the environment caused by hazardous and noxious substances, up to approximately \$500 million. Canada will consult with interested parties prior to formal ratification of the convention.

#### Organization for Economic Co-operation and Development (OECD)

The OECD Maritime Transport Committee (MTC), as part of its regular initiative to eliminate protectionist and promotional measures in the maritime transport sector, has made progress with non-member countries toward an Understanding on Shipping Policy Principles with Dynamic Non-Member Economies (Argentina, Brazil, Chile, Hong Kong, Indonesia, Malaysia, Singapore, Chinese Taipei and Thailand). The dialogue with non-member countries was extended to China in November 1997 at a workshop devoted to shipping policy issues. With 29 member countries, the OECD committee is the primary forum for the discussion of shipping policy issues by developed market economy countries.

In the past two years, the committee has also addressed competition policy and law applicable to international liner shipping. Having observed that diverging competition rules can be detrimental to the modernization of this sector and, more generally, to the development of world trade, the committee is seeking practical solutions to promote the convergence of competition rules governing shipping.

In addition, the committee has assessed the competitive advantages obtained by operators of substandard ships. These advantages result from not observing applicable international rules on maritime safety and the protection of the marine environment. The committee is now considering what economic measures can be taken to address the problem of substandard shipping.

Finally, improving the transparency of support measures provided by member countries remains one of the committee's priorities. It has compiled an inventory of support measures granted to maritime and maritime-related services, including support provided to the research and development sector. In addition, the committee has gathered information on state-owned enterprises, second registers, manning regimes and rules for bareboat chartered vessels.

#### Canada/China Maritime Agreement

Following a request from the People's Republic of China, Canada and China successfully negotiated a bilateral maritime agreement, signed in Vancouver in April 1997. The agreement deals with matters related to ships; access to ports and port facilities; port dues and other charges; taxation; settlement of financial

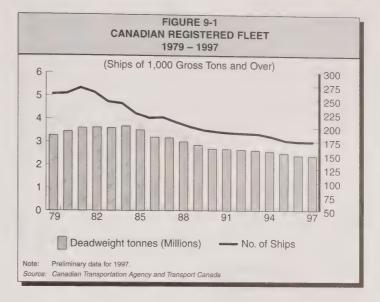
transactions and repatriations of income; maritime incident and accident investigations; security of international maritime transport; entry and stopover of crew members; primacy of national laws; and requests for information on government measures.

# IMPORTANT INDUSTRY EVENTS

#### **Changes to Industry Structure**

1997 saw many important changes in the marine sector. Among the most notable events:

- The operations of the Saint John–Digby and Yarmouth–Bar Harbor ferry services were transferred from Marine Atlantic Inc. to Bay Ferries Ltd., a private-sector operator.
- Canadian Pacific Ltd. (CP Ships) purchased US-based Lykes Bros. Steamship Co. and UK-headquartered Contship Containerlines Ltd.
- MacMillan Bloedel divested itself of its shipping subsidiary Canadian Transport Co. Ltd. and its tug and barge operation, Kingcome Navigation.
- Socanav Inc., the Montrealbased shipping company that once ran a large fleet of oil tankers on the St. Lawrence River, formally declared bankruptcy early in 1997.
- Coastal Transport Ltd., a wholly owned subsidiary of Marine Atlantic, was sold to a private operator.
- The Government of Newfoundland took control of Labrador's coastal marine service for \$347 million and was transferred two ferry vessels worth \$25 million.
- The federal government transferred ownership of the Port of Churchill to OmniTRAX Inc.



#### **New Services and Facilities**

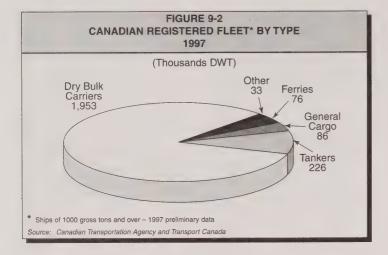
A number of important infrastructure or services-related events also took place in 1997, affecting Canada's marine transportation operations:

- The Confederation Bridge, linking Prince Edward Island with mainland Canada, opened on June 1, 1997, and resulted in the termination of Marine Atlantic's Borden, Prince Edward Island, to Cape Tormentine, New Brunswick ferry service.
- The Port of Vancouver opened Deltaport, a new state-of-the-art container facility.
- Three major international operators, Maersk Line, Sea-Land and P&O Nedlloyd Ltd., offered new liner service to the Port of Montreal.
- Marine Atlantic sold the Newfoundland Dockyard to local interests.
- Great Lakes cruising re-opened with the arrival of Hapag Lloyd's Columbus, the first large

cruise ship on the Great Lakes in more than 20 years.

Likewise, improvements in marine services in 1997 came from the acquisition of equipment:

- Fednav Limited ordered four new deep-sea bulk carriers specially designed for navigation through the St. Lawrence Seaway. This follows an earlier order for six such vessels in 1994, the last of which was delivered in August 1997.
- Canada Maritime Ltd. and Orient Overseas Container Line (OOCL) have placed orders for three new container ships of over 2,600 Twenty-Foot Equivalent Units for their joint Montreal–Europe service.
- Irving took delivery of two new double hulled supertankers, the Primrose and the Galloway.
- The federal government purchased a new ferry to provide service to the Magdalen Islands.
   The M.V. Madeleine was in operation from July to November 1997.



## Marine Transport Services

Canadian flag vessels are active not only in domestic or coasting trades but also in the transborder trades between Canada and the US. In 1996, the Canadian-registered merchant fleet carried nearly 98 per cent of the coasting trade and about 55 per cent of Canada–US waterborne trade, but less than one per cent of Canadian overseas trade.

The preliminary data for 1997 in Figure 9-1 indicate that the Canadian registered merchant fleet consisted of 174 self-propelled vessels (more than 1,000 gross registered tons) with a total deadweight tonnage of 2.4 million tonnes. These figures represent a decrease of nine vessels or nearly four per cent in the number of vessels compared with early 1996, and a decrease of five per cent in deadweight tonnage. The dry bulk carriers form the backbone of this fleet, with 41 per cent of the vessels and 82 per cent of deadweight carrying capacity. The liquid bulk carriers ranked second with ten per cent of total carrying capacity (Figure 9-2). The average

age of vessels in the Canadian merchant fleet in 1997 was 26 years.

The Canadian Transportation Agency estimated that the Canadian fleet of tugs and barges (100 gross tons and over) in 1997 included 253 tugs and 1,312 barges respectively, for a total of 1.5 million gross tons.

## DOMESTIC AND TRANSBORDER SHIPPING SERVICES

#### **Eastern Canada**

In 1997, the Canadian Shipowners Association represented 11 companies operating in Eastern Canada, with a combined fleet of 89 vessels - one of which sails under foreign registry. A year earlier its membership consisted of 12 companies with a fleet of 101 vessels. Companies operating in the St. Lawrence River and Atlantic regions are represented by the St. Lawrence Ship Operators Association (21 active members in 1997), based in Quebec City. Four companies were members of both associations, while other companies, like the Irving Group, were not members of either.

The largest portion of the Canadian domestic fleet operates in the Great Lakes—St. Lawrence Seaway system. In 1997, the active dry bulk fleet included 34 straight-deck bulkers, 30 self-unloader bulkers, two cement carriers and five other bulk vessels.

From 1989 to 1997, the number of straight-deck bulkers decreased from 48 to 34 vessels or 29 per cent. This was a result of various factors, including ships being operated under another flag (flagged out), sold to foreign interests for scrap, and converted to self-unloaders. Algoma Central Marine and Upper Lakes Shipping controlled 25 of the straight-deck bulkers through a pooling agreement, and operated under the name Seaway Bulk Carriers. Straight-deck bulkers mainly carried grain downbound to St. Lawrence ports and iron ore as backhaul cargo for upbound destinations.

The fleet of self-unloader bulkers remained relatively stable between 1989 and 1997, with vessels that were flagged out or scrapped being balanced by new entries, primarily conversions from straight-deck bulkers. In 1997, Algoma Central Marine and Upper Lakes Shipping operated 19 selfunloaders through a pooling agreement ("Seaway Self-Unloaders"), while Canada Steamship Lines Inc. operated the remaining 11 vessels in the fleet. Self-unloaders serve a more diversified market than straightdeck bulkers, moving coal, iron ore, stone, salt, gypsum, and other cargos.

Other vessels operating in the Great Lakes-St. Lawrence region included two cement carriers, five multipurpose bulkers and five tankers, run by Transport Desgagnés, Canada Steamship Lines and other companies. There were also extensive ferry services.

At the end of 1997, the Canadian fleet operating on the Atlantic Coast included 16 ferries, 20 multipurpose cargo vessels and 15 tankers.

#### Western Canada

There is a significant tug and barge fleet on the West Coast and an important fleet of ferry vessels. The Council of Marine Carriers represents tug and barge operations on the West Coast through British Columbia into Alaska, the Beaufort Sea and Hudson Bay, and on the Fraser and Mackenzie River systems. Collectively, its members operate 250 towing vessels and over 750 dumb barges. Most members operate in domestic trade, but some trade internationally between Canadian and US ports.

In late 1997, MacMillan Bloedel Ltd. announced the sale of its tug and barge division, Kingcome Navigation, to Montana businessman Dennis Washington. The sale includes two log ships, a self-propelled rail-car carrier, five tugs and two barges. Kingcome will continue to provide transportation services to MacMillan Bloedel under a long-term contract. Mr. Washington also owns Seaspan International Ltd., Canada's largest tug and barge operation.

#### Northern Canada

#### The Port of Churchill

In 1997, the federal government transferred ownership of the Port of Churchill to OmniTRAX Inc. This deal includes a federal investment of \$28.05 million to upgrade its facilities. In recent years, the port has moved over 300.000 tonnes of commodities

annually, mainly grain for export. In addition to grain, the port also plays an important role in the resupply of Northern communities in the Keewatin/Hudson Bay region of the Northwest Territories. Cargo, averaging about 30,000 tonnes per year, consist primarily of petroleum products, building materials, vehicles, equipment and other essential supplies.

#### Mackenzie River/Western Arctic

This water system is served by seasonal tug and barge services on the Mackenzie River and along the Arctic coastline from Alaska to the lower Arctic islands and Taloyoak. Cargos consist primarily of bulk fuel and community resupply goods.

#### Eastern Arctic

Each year an Eastern Arctic sealift takes place, co-ordinated by the Department of Fisheries and Oceans under the authority of the Treasury Board of Canada. In 1996, the communities served included coastal Labrador, Baffin Island, the middle and high Arctic, Foxe Basin, and Greenland. The Coast Guard contracted the services of three commercial shipowners and one tanker owner for the sealift. Five dry cargo ships and one tanker, with icebreaker support when necessary, delivered dry cargo, fuel, bulk petroleum, petroleum oil and lubricants. All ships were Canadian registered and staffed. Dry cargo supplies were delivered to twenty-three Arctic sites and communities, including the North Warning System sites. Bulk petroleum products were delivered to eight sites. The total shipment included 9,082 tonnes of dry cargo and 3.350 cubic metres of bulk petroleum products. While the dry cargo shipments were down from the 14,376 tonnes delivered in

1995, the movement of bulk petroleum was more than three times higher than the 1,052 cubic metres shipped in 1995.

#### FERRY SERVICES

Canada's ferry services vary widely in terms of ownership (from small private operators to provincial governments and federal Crown corporations), vessel types (small cable ferries to large cruise vessels and fast ferries), and operations (seasonal to year-round schedules). Terminal and docking facilities are variously owned, leased and operated by ferry companies, municipalities, provincial and federal governments or private companies.

Under the Canada Shipping Act,
passenger vessels with a capacity of
more than 12 passengers or over
five gross tons must obtain a
Certificate of Inspection to operate,
and are submitted to regular Coast
Guard inspections.

## Federal Role with Respect to Ferries

In accordance with the National Marine Policy announced in December 1995, the federal government is looking at ways to reduce operating costs and increase efficiency through new vessel management and procurement practices, commercial operation of vessels, and the streamlining of ferry services. The federal objective is to focus on safety and security, constitutional obligations and isolated community services.

Effective April 1, 1997, federally supported ferry services in Atlantic Canada are limited to those provided by Marine Atlantic

#### OVERVIEW OF MAJOR FERRY SERVICES AND CHANGES

Marine Atlantic Inc. (MAI), a federal Crown corporation, operates the constitutionally guaranteed ferry link between North Sydney, Nova Scotia, and Port-aux-Basques, Newfoundland, and the seasonal alternative between North Sydney, Nova Scotia, and Argentia, Newfoundland.

Coastal Transport Ltd. operates the ferry service between Black's Harbour, New Brunswick, and North Head, Grand Manan, under contract with the Province of New Brunswick. Since October 1, 1995 it has also operated a ferry service between the islands of Grand Manan and White Head.

Northern Cruiser Ltd. (NCL) operates a passenger/vehicle ferry service between Blanc Sablon, Quebec, and St. Barbe, Newfoundland, from May to January, under contract with the Province of Newfoundland.

Northumberland Ferries Ltd. (NFL) provides seasonal ferry transportation (May 1 to December 20) between Caribou, Nova Scotia, and Wood Islands, Prince Edward Island, under contract with the federal government. The MV Holiday Island, a Marine Atlantic Inc. vessel, which became surplus upon the opening of the Confederation Bridge, began operating as part of this service in June 1997 to replace the aging Prince Nova and Prince Edward. Deployment of this vessel improves NFL's carrying capacity and efficiency.

Bay Ferries Limited was awarded a five-year contract with the federal government to provide yearly passenger and vehicle ferry service between Saint John, New Brunswick, and Digby, Nova Scotia, and seasonal service between Yarmouth, Nova Scotia, and Bar Harbor, Maine, effective April 1, 1997. A federal subsidy will be provided to Bay Ferries for the first three years of its five-year operating contract, after which it is expected that service will continue without further federal involvement.

Gestion C.T.M.A. enr. (C.T.M.A.) provides federally subsidized passenger/vehicle ferry service between Cap-aux-Meules, Magdalen Islands, Quebec, and Souris, Prince Edward Island, during the ice-free period from early April until late January. In July 1997, the federal government purchased the Irish vessel MV Isle of Inishturk (renamed under Canadian flag MV Madeleine), to replace the aging MV Lucy Maud Montgomery. Use of this newly acquired vessel increased C.T.M.A.'s carrying capacity from 300 passengers and 90 auto-equivalent units (as provided by the Lucy Maud Montgomery) to 1,000 passengers and 250 auto-equivalent units, reducing the number of sailings required during the shoulder season. C.T.M.A. also provides a passenger and cargo ferry service from Cap-aux-Meules to Montreal from April to December, and from Cap-aux-Meules to Matane during the winter, under contract with the Province of Quebec.

In 1997, the Province of Newfoundland reached an agreement with the federal government to assume responsibility for ferry services to and along the coast of Labrador. **Newfoundland and Labrador's Department of Works, Services and Transportation** now provides all of the intra-provincial and coastal ferry services.

Quebec's transportation ministry subsidizes la Société des traversiers du Québec (STQ), which operates a total of eight ferry routes on the St. Lawrence River, five of which operate year-round. Private organizations manage three of the eight ferry routes on behalf of STQ. La Traverse Rivière-du-Loup/Saint-Siméon Ltée also operates a one-vessel passenger-and-vehicle service on the St. Lawrence River.

The Quebec Ministry of Transportation subsidizes three regular passenger and freight lines, four private ferry operations, and a water taxi. It also owns three small ships that are operated by local groups. In addition, the Ministry is responsible for the adjudication of contracts for transporting supplies to native communities in Northern Quebec.

The Ontario Ministry of Transportation owns and operates four ferry services and supports six municipal ferry services. Negotiations are currently under way to have the government transfer ferries that meet primarily local traffic needs or that link local roads, where a suitable municipal recipient exists. Transition plans are under way and the transfer of full authority to the municipalities will take effect following approval of the enabling legislation, some time in 1998. Ferries that will no longer receive provincial funding include the two serving Howe Island, and those that serve Amherst, Wolfe, Simcoe, MacKenzie, Pelee and Toronto islands. The province will retain responsibility for the Glenora ferry, which is a link for a provincial highway, and the Abitibi ferry, which serves a sparsely populated area.

The Owen Sound Transportation Company (OSTC) provides transportation services on Lake Huron between Tobermory and South Baymouth on Manitoulin Island, from early May until mid-October. OSTC also manages transportation services on Lake Erie between Leamington/Kingsville and Pelee Island, Ontario, and Sandusky, Ohio, from April through December, on behalf of the Ontario Ministry of Transportation.

The Manitoba Department of Highways and Transportation operates seven passenger and vehicle ferries, three motor vessels and four cable ferries.

The British Columbia government receives a federal grant for the provision of ferry services in coastal waters. **British Columbia Ferry Corporation (BC Ferries)**, a provincial Crown corporation, is the largest ferry operation in North America, with a fleet of 40 vessels. The system includes 43 marine terminals plus seven other sites, and encompasses 26 routes. The corporation has an extensive capital program under way. A new 100-car, open-deck ferry was launched in 1997 and three new high-speed catamarans are currently under construction, with the first expected to be delivered during the summer of 1998. In addition, a new terminal is being built at Duke Point, while several others are being upgraded.

The **Ministry of Transportation and Highways** is responsible for 17 freshwater ferry routes in British Columbia. In 1996, the Adams Lake ferry service was converted from a tug and barge operation to a cable ferry. This permitted an extension in the hours of service and a reduction in operating costs.

Inc., a federal Crown corporation, and to three private-sector operators – Northumberland Ferries Limited, Bay Ferries Limited, and C.T.M.A. Traversier Itée. Federal assistance for ferry services in Western Canada in the form of a grant will continue to be provided to the Province of British Columbia.

# INTERNATIONAL MARINE SERVICES

Historically, Canadian flag vessels have carried less than one per cent of international marine traffic other than in transborder trade with the United States. Thus Canadian shippers rely on foreign-based carriers for most international marine movements.

#### **Bulk Shipping**

Bulk commodities figure prominently in Canada's international trade, particularly for exports. Most bulk shippers charter vessels as needed to meet their shipping requirements. Either the buyer or seller of the commodity may be responsible for making the transportation arrangements, depending on the terms of sale. The charter rates for bulk carriers are set in the open market, which is global and intensely competitive.

The "spot" or "tramp" market is made up of short-term contracts covering a certain number of voyages or days, or a given quantity of cargo. Spot prices are set in open markets and exchanges, and depend on supply-and-demand factors that include vessel size, equipment, trade route and timeliness of the service requirements.

Time charters can cover longer periods (e.g., five years), enabling shippers to secure regular and predictable transportation rates during the period of the contract. Vessels are sometimes even built to the specific requirements of a given shipper in connection with a pre-arranged long-term charter. However, contracts covering only one year are common when prices are volatile. Details of the arrangements are usually strictly confidential.

#### **International Liner Shipping**

Liner services are offered according to published schedules and on specific trade routes with fixed itineraries. Liner carriers generally handle containerized and/or break-bulk cargos, such as electronic equipment, frozen foods or manufactured goods, which are traditionally of higher value. Break-bulk refers to cargo that is bagged, palletized or otherwise packaged and does not move in a container. Forest products and automobiles both fall into this category. The lines that carry containers, break-bulk and general cargo are the "common carriers" in international marine transportation.

The international liner trade is dominated by large fleets of specialized container ships operating on major routes. A large proportion of the world fleet is controlled by Pacific Rim and Western European interests.

Ocean carriers providing liner services on a common trade route often elect to form a conference and collectively agree on rates and/or conditions of service. Conferences have been in existence on major routes for well over a century and are shielded from the competition laws in Canada by the Shipping Conferences Exemption Act, 1987.

Shipping lines that do not operate within the confines of a shipping conference are referred to as "independents" or "nonconference operators". These carriers also provide liner services but are not required to file a tariff with the Canadian Transportation Agency. While nearly all of the tonnage moved by conference carriers is containerized, that of independent lines includes a larger share of general/break-bulk cargos. The ranks of the independent liner operators today include many large, well-established firms such as Evergreen Lines and China Ocean Shipping Company that can match conference operators in terms of vessel size, operating frequency and extensive route networks

Lines that are conference members on one route are not necessarily conference members on all of the routes or points served. Also, where a conference agreement applies only to Canadian cargo, shipping lines that solicit cargo from US-based shippers (such as North Atlantic operators calling at Montreal) could carry non-conference cargo on the same vessels that operate in the conference service.

# Services Available to Canadian Shippers

Nineteen tariff-filing shipping conferences, shown in Table 9-1, served Canada in mid-1997, down from 20 in 1996. The Asia North America Eastbound Rate Agreement, one of the major conferences on the Canada–Far East trade circuit, was dissolved effective November 1, 1996. Of the 19 conferences, five covered services to and from both Canadian coasts, 12 to and from the East Coast only, and two to and from the West Coast only.

## TABLE 9-1 SHIPPING CONFERENCES SERVING CANADA IN 1997

American West African Freight Conference (E) Australia/Canada Container Line Association (E & W) Canada/Australia-New Zealand Association of Carriers (E & W) Canada Caribbean Shipowners Association (E) Canada - United Kingdom Freight Conference (E) Canada Westbound Rate Agreement (E & W) Canadian Common Tariff Conference (E) Canadian Continental Eastbound Freight Conference (E) Canadian North Atlantic Westbound Freight Conference (E) Continental Canadian Westbound Freight Conference (E) Eastern Canada/Caribbean Rate Association (E) Eastern Canada – South America Rate Agreement (E) Japan - East Canada Freight Conference (E) Japan - West Canada Freight Conference (W) Mediterranean Canadian Freight Conference (E) Mediterranean North Pacific Coast Freight Conference (W) New Zealand/Canada Container Line Association (E & W) The "8900 Lines" Rate Agreement (E) West Coast/Middle East Canada Rate Agreement (E & W)

E = East Coast: W = West Coast.

Source: Canadian Transportation Agency

# 1997 Developments in Liner Shipping

A new liner service partnership involving Maersk Line, Sea-Land Service Inc. and P&O Nedlloyd Ltd. began operations between the Port of Montreal and Northern European ports in 1997. With this increased competition at the Port of Montreal, the Competition Bureau requested a stay of proceedings from the Competition Tribunal on the 1995 acquisition of Cast North America Inc. by Canadian Pacific Ltd. (CP Containers Ltd.). The Competition Bureau determined that the merger either prevented or lessened, or would likely result in preventing or lessening of competition in the liner trade between the Port of Montreal and Northern Europe, and asked the Competition Tribunal to review and overturn the acquisition. The Bureau has until March 31, 1998, to ask the Tribunal to restart the proceedings, otherwise the case will be closed.

During 1997, Canadian Pacific Ltd. (CP Ships), in separate transactions, purchased both the US-based Lykes Bros. Steamship Co., which was operating under bankruptcy protection, and Contship Containerlines Ltd., headquartered in Ipswich, England. Lykes Bros. gives CP Ships additional routings, connecting ports in the US, Mexico, Northern Europe, the Mediterranean and Africa. Contship extends the trade lanes covered by CP Ships to include South America, Australia and India. These two acquisitions, along with the earlier acquisition of Cast North America, strengthens CP Ships' position as one of the world's major container liner operators.

In 1997, Deltaport, the Port of Vancouver's new multi-million dollar state-of-the-art container facility, began operations, doubling the port's container capacity. The facility can handle the largest container vessels currently in service and is capable of transferring containers to double-stack rail cars for immediate dispatch to Central Canada and the US Midwest. With the opening of Deltaport, some shipping companies are bringing larger vessels and increasing their sailing schedules to the port.

#### CRUISE SHIP INDUSTRY

For the first time in over two decades a luxury cruise ship sailed the Great Lakes. The 420-passenger *M/S Columbus* was custom-designed for cruising in the Great Lakes by its owner Hapag Lloyd.

Foreign-based companies provide the vast majority of extended cruise operations calling at ports on both Canada's East and West coasts. There are two basic categories of extended cruises – the "luxury cruise" and the "pocket cruise", distinguished by vessel capacity of more or less than 150 passengers.

The Port of Vancouver is the home port for most of the luxury cruise ships offering Alaska cruises, serving as the principal point of passenger embarkation and disembarkation. Alaska is the third largest cruise market in the world, after the Caribbean and Europe. Vancouver has benefited from the provisions of the US Passenger Vessel Act, which prohibit foreign-flag vessels from carrying passengers between US ports (i.e., embarking passengers at one US port and disembarking them at another). Vancouver is also an en-route stop on various other cruises, such as round-trip Alaskan cruises out of San Francisco and Los Angeles. The Vancouver cruise market is also linked with cruise operations in Victoria and other B.C. ports.

In Eastern Canada, the New Atlantic Frontier Cruise Association, a coalition of Atlantic seaboard ports including Halifax, New York, Boston, Portland, Montreal, Quebec City and St-Pierre, is working to attract major cruise ship lines to the region. Luxury cruise ships regularly travel along the Eastern Seaboard and up the St. Lawrence to Montreal. They also sail out of New York northward to Halifax and Saint John. Pocket cruises travel the St. Lawrence between Montreal or Quebec City and Kingston or Rochester, or along the Erie Canal and Hudson River to Warren, New York.

The cruise industry is heavily dependent on efficient airlines and motor coach connections. It generates pre- and post-cruise travel on rail and motor coach tours.

There are also a multitude of lock, harbour and river cruises, as well as excursions such as those for whale-watching – all offered by local operators on Canadian vessels. Whale-watching cruises continued to be very popular among European clients.

## MARINE TRANSPORT SERVICES TRAFFIC

Canadian maritime trade traffic has three main components – domestic, transborder trade with the US and international (overseas). In 1996, these movements amounted to 308.9 million tonnes. Domestic trade accounted for 48.8 million tonnes, while transborder trade between Canada and the US totaled 88.5 million tonnes. Domestic trade represented a decline from the 50.4 million tonnes moved in 1995, while

	TABLE 9-2
CANADA'S	MARINE TRAFFIC FLOWS, BY SECTOR
	1986 1996

	(Million	s of tonnes)		
		s or tonnes)		
	Domestic	Transborder	Overseas	Total
1986	60.5	68.2	138.4	267.1
1987	67.6	73.2	153.8	294.6
1988	70.0	83.8	166.2	320.0
1989	62.0	82.7	156.7	301.4
1990	60.4	76.2	156.1	292.7
1991	57.9	67.0	167.2	292.1
1992	52.3	67.9	155.3	275.5
1993	50.4	69.9	154.2	274.5
1994	52.2	78.8	168.1	299.1
1995	50.4	85.2	174.6	310.2
1996	48.8	88.5	174.5	311.8
Source: Statistics Canada, Cat.	54-205			

# TABLE 9-3 MARINE DOMESTIC FLOWS, BY CANADIAN REGION 1996

(Thousands of tonnes)

Region of Origin	Re	Region of Destination (Unloadings)				
(Loadings)	Atlantic	St. Lawrence	Great Lakes	Pacific	All Regions	
Atlantic	3,711	1,310	265	0	5,286	
St. Lawrence	1,232	6,574	5,963	0	13,769	
Great Lakes	320	6,187	8,818	0	15,325	
Pacific	0	0	0	14,450	14,450	
All Regions	5,262	14,071	15,046	14,450	48,829	

Source: Statistics Canada, Cat. 54-205.

transborder traffic continued its upward trend. Overseas trade reached 171.6 million tonnes. Table 9-2 illustrates Canada's marine traffic flows by sector.

### **DOMESTIC TRAFFIC**

#### Freight

Domestic cargo shipped from one Canadian port to another is handled twice by the port system – loading and unloading. In 1996, Canadian ports handled domestic cargo amounting to 97.7 million tonnes, a three per cent decrease compared with 1995. In fact, domestic cargo has been

decreasing since its peak in 1988, when ports handled 139.9 million tonnes. This decline has come partly from a change in the direction of Canada's international trade. In the 1980s, many commodities, such as grain, were carried as domestic cargo via the St. Lawrence Seaway system and then transferred at Canada's eastern ports for shipment overseas. Currently, however, these commodities are being carried increasingly by rail to Canada's western ports for shipment overseas. Table 9-3 shows domestic marine traffic flow by region.

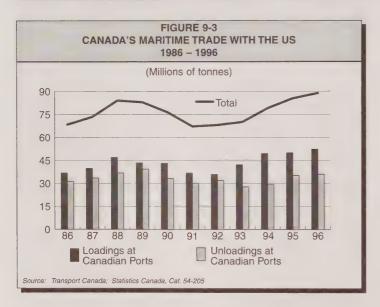
TABLE 9-4
CANADA'S INTERNATIONAL TRADE
- MARINE TRANSPORTATION
1996

	(\$million Car	nadian)	
	Marine	All Modes	Marine Share
Transborder			
Exports	6,999	223,479	3.1
Imports	2,411	157,494	1.5
Total US	9,410	380,973	2.5
Overseas			
Exports*	37,411	50,305	74.4
Imports	36,136	75,620	47.8
Total Overseas	73,547	125,925	58.4

\* Overseas exports include domestic exports only; re-exports are excluded

Note: For exports, mode of transport means the mode by which the international boundary is crossed. For imports, the mode of transport represents the last mode by which the cargo was transported to the port of clearance in Canada; this may not be the mode of transport by which the cargo arrived at the Canadian port of entry in the case of inland clearance. This led to some underestimation of Canadian imports by the marine and air transport modes.

Source: Statistics Canada, Cat. 65-202, 203, Transport Canada



The bulk of domestic traffic is concentrated in the St. Lawrence—Great Lakes area. Its ports handled 58.2 million tonnes (loadings and unloadings) in 1996, the equivalent of 59.6 per cent of the total domestic tonnes. The Pacific region ranked second, handling 28.9 million domestic tonnes, a 30 per cent share of the total.

The main commodities handled, include: iron ore (14.1 million tonnes in 1996, a two per cent increase over 1995); pulpwood and chips (13.4 million tonnes, down eight per cent from 1995); fuel oil and gasoline (13.1 million tonnes, down 14 per cent from 1995); wheat (9.7 million tonnes, down 14 per cent from 1995); and

stone/limestone (9.3 million tonnes, up 23 per cent from 1995).

Preliminary data for domestic tonnes handled over the first three quarters of 1997 indicate a two per cent decrease over the same period in 1996, (respectively, 67.1 million tonnes and 68.4 million tonnes).

#### **Ferry Passengers**

Because 1997 figures were not available for all ferry service operators, 1996 figures were used. British Columbia Ferry Corporation, by far the largest operator in Canada, carried approximately 22.2 million passengers and 8.1 million vehicles. British Columbia's Ministry of Transportation and Highways carried 5.2 million passengers and 2.9 million vehicles. Société des traversiers du Ouébec carried 5.3 million passengers and 1.8 million vehicles, while Marine Atlantic carried about 2.7 million passengers and 1.3 million vehicles in 1996. The remaining Canadian Ferry Operators Association members accounted for 4.3 million passengers and 1.9 million vehicles crossings.

#### INTERNATIONAL TRAFFIC

In 1996, international cargo movements totaled 260.1 million tonnes, a less than one per cent increase compared with 1995. Of total international tonnes handled in Canadian ports, 67 per cent are export-oriented (including intransit and re-export traffic).

According to international trade data, the value of the Canadian international marine trade in 1996 was approximately \$83 billion (excluding shipments via US ports), with exports valued at

\$44 billion and imports at nearly \$39 billion. Canada's main deepsea trading partners – Japan, China, South Korea, the United Kingdom and other Western European nations – together represent over 60 per cent of total Canadian international marine trade in 1996.

Table 9-4 shows the value of Canada's international marine trade in 1996.

#### Transborder Traffic

Canada's marine trade with the US experienced a steady growth of 32 per cent from 1991 to 1996, fueled by both exports and imports. In 1996, transborder trade reached a peak of 88.5 million tonnes, a four per cent increase compared to 1995.

Preliminary data for the first three quarters of 1997 indicate that this rising trend is continuing, with transborder tonnage increasing by seven per cent to 65.6 million tonnes from 61.5 over the same period in 1996. Exports (loadings to US destinations) lead this trend with a ten per cent increase to 40.6 million tonnes from 36.8 million tonnes.

Marine trade with the US was valued at \$9.4 billion in 1996, driven by exports of \$7 billion. This value, however, represented only three per cent of total Canada—US trade. The bulk of the trade was handled by surface transport modes, such as trucking with 68 per cent of the total, and rail with 17 per cent.

#### **Exports**

In 1996, loadings to the US jumped to 52.4 million tonnes, a five per cent increase compared with 1995. Dry and liquid bulk commodities were the main products loaded for US

CAN		BLE 9-5 NE TRAFFIC TO 1996	THE US		
	(Millior	ns of tonnes)			
Canadian Region	L	US Region of Destination			
of Origin	US Atlantic	US Great Lakes	US Pacific	Total	
Atlantic	19.7	-	0.1	19.8	
St. Lawrence	6.7	6.8	-	13.5	
Great Lakes	0.1	10.5	-	10.6	
Pacific	1.2	-	7.4	8.6	
Total	27.7	17.3	7.5	52.5	
Source: Statistics Canada,	Cat. 54-205; Transport	Canada			

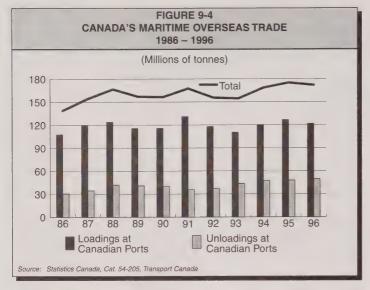
CANA		BLE 9-6 TRAFFIC FRO 1996	M THE US		
	(Millior	ns of tonnes)			
Canadian Region		US Region of Origin			
of Destination	US Atlantic	US Great Lakes	US Pacific	Total	
Atlantic	1.8	0.3	-	2.1	
St. Lawrence	3.3	5.0	0.3	8.6	
Great Lakes	0.2	21.8	-	22.0	
Pacific	-	-	3.4	3.4	
Total	5.2	27.2	3.7	36.1	
Source: Statistics Canada, (	Cat. 54-205; Transport	Canada	,		

destinations. They included petroleum products (fuel oil, gasoline and crude petroleum, totaling 13.0 million tonnes); iron ore (11.3 million tonnes); gypsum (5.5 million tonnes); stone/limestone (4.6 million tonnes); and salt and cement (3.5 and 3.2 million tonnes, respectively). Figure 9-3 shows Canada's maritime trade with the US from 1986 to 1996.

There were two main flow corridors in 1996: the "Canadian Atlantic to the US Atlantic" route with 19.5 million tonnes or 37 per cent of total loadings to the US, and the "Canadian Great Lakes to US Great Lakes" route, with 10.5 million tonnes. Table 9-5 details traffic flows from Canada to the US in 1996.

#### **Imports**

On the import side, unloadings from the US registered a slight increase of two per cent, from 35.3 million tonnes in 1995 to 36.1 million tonnes in 1996. Commodities unloaded at Canadian ports coming from US destinations included coal (11.6 million tonnes), iron ore (6.3 million tonnes), petroleum products (3.8 million tonnes), grain, including wheat, corn, and sovbeans (3.5 million tonnes) and stone/limestone (3.5 million tonnes). Over 75 per cent of total marine imports came from the US Great Lakes area. Table 9-6 shows the traffic flow from the US to Canada in 1996.



CANADA'S MA	TABLE 9-7 ARINE TRAFFIC 1996	TO OVERSEAS	
(1	Millions of tonne	es)	
Foreign Region	Canadian Re		
of Destination	Eastern ports	Western ports	Total
Asia & Oceania	5.6	56.9	62.5
Europe	29.3	7.9	37.2
South and Central America	5.0	7.4	12.4
Middle East and Africa	4.8	5.0	9.8
Total	44.7	77.2	121.9

#### Overseas Trade

In 1996, the total Canadian marine trade with overseas countries (excluding Canada–US trade) amounted to 171.6 million tonnes, down two per cent from the 1995 peak of 174.6 million tonnes. This trade has been strongly exportoriented with the loading share oscillating between 71 per cent and 79 per cent over the last 10 years. Around 60 per cent of total loadings to overseas countries were loaded at Canadian West Coast ports; however, over 90 per cent of

overseas imports were unloaded at Canada's eastern ports.

Preliminary data for the first three quarters of 1997 shows an 11 per cent increase (from 124.1 to 138.4 million tonnes) in tonnes handled in the Canada/overseas marine trade over the same period in 1996. Both loadings and unloadings of overseas commodities at Canadian ports also registered a growth for the first three quarters in 1997. Loadings grew nine per cent (from 88.2 to 96.5 million tonnes) and unloadings

by 17 per cent (from 35.9 to 41.9 million tonnes) over the same period.

In 1996, the Canadian marine trade with overseas countries (excluding Canada–US trade) was valued at approximately \$74 billion (Canadian dollars), with exports estimated at \$38 billion and imports at \$36 billion. Marine transport was the dominant mode of transport for shipping overseas freight, followed by air. Figure 9-4 illustrates Canada's maritime trade with the overseas market from 1986 to 1996.

#### **Exports**

In 1996, Canadian marine loadings for overseas countries accounted for 121.9 million tonnes, down by four per cent compared with 126.6 million tonnes in 1995. Major commodities shipped overseas included coal (33.5 million tonnes), iron ore (18.5 million tonnes), wheat (16.3 million tonnes) and other grains (7.3 million tonnes). Other important shipments included forest products such as wood pulp (6.0 million tonnes); lumber (4.5 million tonnes); sulphur (5.1 million tonnes); and potash (5.0 million tonnes). Only eight per cent of this trade was containerized.

Over 60 per cent of Canadian loadings for overseas destinations came from the western ports in 1996, while the St. Lawrence—Great Lakes Canadian ports handled most of the eastern share. The direction of trade was highly polarized with the Western ports dominating the Asia and Oceania trade route, while the Eastern ports handled a high proportion of tonnage shipped on the European trade route. Table 9-7 shows Canada's marine traffic to overseas markets in 1996.

#### **Imports**

In 1996, marine unloadings at Canadian ports from overseas destinations reached 49.7 million tonnes, an almost four per cent increase over 1995 (47.9 million tonnes). Crude petroleum (25.4 million tonnes) dominated, accounting for 51 per cent of all tonnage unloaded from overseas countries. Other overseas commodities unloaded included alumina/bauxite (5.1 million tonnes); gasoline/fuel oil (2.4 million tonnes); iron and steel products (2.1 million tonnes); iron ore (1.5 million tonnes); and phosphate (1.1 million tonnes). Approximately 13.5 per cent of this trade was containerized.

Over 90 per cent of overseas shipments were unloaded at Canadian Eastern ports. The Canadian Atlantic ports handled 46 per cent (22.8 million tonnes) of total overseas unloadings and the St. Lawrence—Great Lakes ports took a 45 per cent share (22.5 million tonnes). The Europe and the Middle East-Africa regions were the principal origins of overseas cargo. Table 9-8 shows Canada's marine traffic from overseas markets in 1996.

#### CRUISE SHIP TRAFFIC

The 1997 season marked the fifteenth consecutive year of growth for Alaska cruises, with a 17 per cent increase over 1996 traffic levels for the Port of Vancouver. The Vancouver—Alaska market now ranks as the third most popular cruise region in the world, behind the Caribbean and Europe. Table 9-9 summarizes cruise traffic for major Canadian ports.

The Canadian Passenger Vessel Association estimated traffic at over 6.5 million passenger trips in 1996 on the vessels of its members.

	TABLE 9-8	3	
CANADA'S	MARINE TRAFFIC	FROM	<b>OVERSEAS</b>
	1996		

Millions of tonne	es)	
Canadian Region		
Eastern ports	Western ports	Total
21.5	0.2	21.7
11.6	1.0	12.6
9.4	0.9	10.3
2.8	2.3	5.1
45.3	4.4	49.7
	Canadian Region Eastern ports 21.5 11.6 9.4 2.8	21.5 0.2 11.6 1.0 9.4 0.9 2.8 2.3

# TABLE 9-9 CRUISE SHIP TRAFFIC AT MAJOR CANADIAN PORTS 1990 – 1997

1330 – 1937						
	(Passengers)					
Year	Vancouver	Montreal	Quebec City	Halifax	Saint John	
1990	388,323	30,869	34,783	24,423	1,748	
1991	423,928	47,047	51,363	43,512	3,402	
1992	449,239	34,872	41,141	30,112	5,500	
1993	519,942	30,626	38,642	30,917	12,379	
1994	591,409	33,920	36,401	37,717	23,629	
1995	596,744	27,384	38,981	30,257	12,226	
1996	701,547	19,078	21,464	36,584	8,543	
1997	816,537	29,324	36,569	44,328	19,813	
Source: Lo	cal Port Corporations					

To that figure must be added the 909 thousand passengers carried in 1996 by members of the Association des Croisières-Excursions du Québec and the estimated 1.8 million passengers of non-member companies of associations.

## COMPETITION

#### DOMESTIC COMPETITION

In Canadian waters, the competition for transporting cargo and passengers can take place between Canadian ships, as delimited by the *Coasting Trade Act*. The legislation provides for

the temporary importation of foreign and non-duty-paid Canadian flag vessels in domestic operations in specified circumstances and eliminates the uncertainties associated with the operation of cruise ships in Canadian waters.

Over the past 10 years, applications for entry to the coasting trade have numbered between 57 and 122 annually. In 1997, 106 applications were received for temporary coasting trade licences, down from 111 in 1996. Of these, 87 were approved, contingent upon there not being a suitable Canadian flag vessel available. Of licences approved, 21 were for tankers, 17 for barges, 12 for tugs, 14 for passenger ships

#### TABLE 9-10 CONFERENCE/NON-CONFERENCE SHARES OF CANADIAN LINER TRADE 1994 – 1996

			(Tonnes)			
		Conference		1	lon-conferenc	e
	1994	1995	1996	1994	1995	1996
Exports	5,647,371	5,627,965	5,894,047	5,262,950	6,458,936	6,796,289
Imports	4,967,164	4,394,247	4,687,610	3,611,641	3,590,149	3,677,553
Total	10,614,535	10,022,212	10,581,657	8,874,591	10,049,085	10,473,842

Source: Statistics Canada. International Shipping Database; Transport Canada

	LINER	TABLE 9-11 TRAFFIC BY RE 1996	GION	
Region		nports (tonnes) Non-conference		xports (tonnes) Non-conference
Europe	3,696,756	1,965,945	3,961,046	1,232,405
Middle East	0	47,666	3,053	349,441
Africa	0	150,640	0	112,750
Asia	990,854	729,901	1,880,198	3,410,219
Oceania	0	66,838	40,431	263,072
South America	0	270,321	6,451	284,162
Central America	0	83,083	2,868	414,120
North America	0	363,204	0	730,120
Total	4,687,610	3,677,553	5,894,047	6,796,289

The Coasting Trade Act entered into force on December 1, 1992, replacing Part X (sections 590 to 595) of the Canada Shipping Act. The Act restricts the transportation of cargo and passengers, along with all commercial marine-related activities in Canadian waters, to Canadian ships. The Act also extends this restriction to the Canadian continental shelf for activities related to exploration and exploitation of non-living natural resources.

The Shipping Conferences Exemption Act, 1987 exempts conference certain shipping practices from provisions of the Competition Act (Canada's antitrust legislation) in recognition of the fact that liner conferences provide a measure of stability and reliability in shipping services to importers and exporters. The Exemption Act allows shipping conferences to set ocean freight rates and services collectively, but requires that the rates be published in a tariff filed with the Canadian Transportation Agency. To promote intra-conference competition and to provide shippers with additional pricing options, the SCEA incorporates provisions for independent action on rates and confidential service contracts.

and 23 for various other types of vessels. US flag vessels accounted for over half of the temporary licences, with 46 out of the total 87. The second most common flag of carriage was the Bahamas with 10, followed by non-duty-paid Canadian flag vessels with eight.

Total domestic trade carried on vessels granted temporary entry to the coasting trade has historically been less than two per cent per year. In 1996, foreign flag vessels were recorded as carrying 2.2 per cent of total domestic trade, up from 1.87 per cent in 1995.

# SHIPPING CONFERENCES EXEMPTION ACT, 1987

Competition in international marine transport services takes place between conference and non-conference carriers. But within conferences, the Independent Action provision within the *Shipping Conferences Exemption Act (SCEA)* permits competition between lines' members of a conference.

Shipping conference rates paid by shippers can be the object of a "service contract", a confidential agreement permitted by the *SCEA*. Service contracts, however, must be filed to comply with the Act.

In 1997, the Canadian Transportation Agency accepted filings for 181 service contracts from 10 shipping conferences. On the other hand, in 1996, the Agency had accepted filings for 140 service contracts from eight shipping conferences, down from the 175 contracts filed in 1995. The great majority of services contracts are conference-wide and remain in effect for one year.

#### Conference/Non-Conference **Shares of Canadian Liner Trade**

The market power of conferences has been declining in recent years. Independent operators offer strong competition on most routes served by conference carriers. Table 9-10 provides a breakdown by conference/non-conference market shares for the period 1994 – 1996.

The flow of containerized and other cargo across the Canada-US border has grown steadily in recent years. All cargo crossing the border moves at non-conference rates, even if carried by conference operators. Thus Canadian containerized cargos routed through US ports move at non-conference rates. Canadian ports such as Montreal and Halifax also handle substantial volumes of US origin or destination cargos. At least half of the container traffic through the Port of Montreal is estimated to be from the US.

The Statistics Canada data in Table 9-10 does not distinguish between US and Canadian cargos. The conference share of imports and exports is significantly overstated in this table, assuming that a substantial volume of the US traffic is carried on conference vessels. Also, if the Canadian liner traffic handled at US ports were added to the non-conference share, the conference proportion of total traffic would be further reduced.

Table 9-11 provides a breakdown by market areas served and gives a more accurate picture of conference/non-conference competition. The data indicate that conferences serving Canada have the largest market share on the routes to and from Europe. Once again, Statistics Canada data have been used and the US and

PRICE AND OUTPI	TABLE 9- UT CHANGES 1992 – 19	IN MARINI	ETRANSP	ORT
	(In per cer	nt)		
Price Changes %	1992	1993	1994	1995
Ferry	5.4	6.0	5.8	4.1
Marine domestic	7.1	0.6	1.0	3.1
Marine international	11.8	3.1	2.5	0.01
Output Changes %	(0.0)			
Ferry	(0.6)	(2.1)	4.9	(0.1)

(14.1)

16.7

(13.4)

(18.6)

Source: Transport Canada based on Statistics Canada files

Pri

Ou

Marine domestic

Marine international

Canadian traffic that is transshipped is not accounted for, thus inflating the conference traffic shares. Conference lines operating on the North Atlantic and calling at the Port of Montreal draw heavily on the US Midwest for their cargo base.

Conferences also have a significant market share of the trade to and from Asia, although not as large as the independent operators' share. On north-south routes, such as those to Africa. Oceania, and Central and South America, conference operators no longer call directly at Canadian ports, but instead move cargos through US ports. The lower volumes on these routes no longer justify the extra sailing time to Canadian ports.

## PRICE AND OUTPUT

In recent years, government ferry operators' price increases averaged 5.3 per cent a year, whereas the volume of their activity, despite some fluctuations, remained constant. Their revenues grew by about six per cent over the period 1992 - 1995. (Table 9-12).

Between 1987 and 1994, the coastal activities of Canada's shipping industry were in decline. Output rebounded in 1995 by 15 per cent. The transborder and overseas activity of Canadian carriers, after dropping 19 per cent in 1992, has exhibited an upward trend since then. Much of the growth came from overseas activities.

(7.6)

7.3

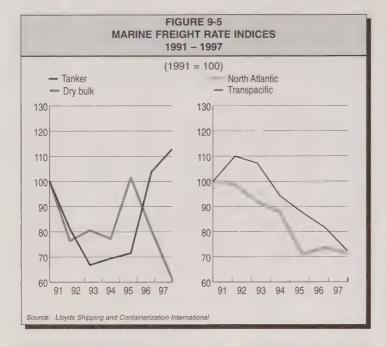
15.2

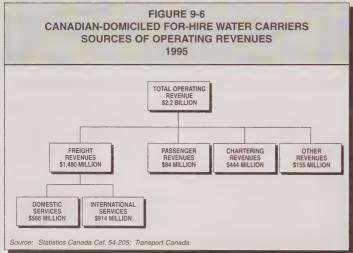
11.7

The Canadian shipping industry is the only freight transport activity for which nominal price increases have been observed. Yet, the freight rate increases have averaged 1.7 per cent a year since 1992, less than the 2.7 per cent annual growth in the economy over the same period.

As previously indicated, most marine services used by Canadian shippers in world markets are provided by foreign shipping lines. Two broad types of services are provided: liner (mostly container services by conference carriers) and bulk services. Freight rates of dry bulk carriers had been volatile but showing a downward trend. In 1997, dry bulk carriers' rates were at 62 per cent of their 1991 level.

Tanker rates have been going up since 1993, although it was not until 1996 that they surpassed their





1991 levels. They continued to increase in 1997. In spite of strong demand, container shipping services are affected by rampant excess capacity and rates are faltering. After the first three quarters of 1997, rates on North Atlantic and Pacific routes, (based on average westbound and eastbound to/from the US), were around 30 per cent lower than 1991 rates (Figure 9-5).

## FINANCIAL PERFORMANCE

#### **Revenues and Expenses**

The Canadian marine transport industry comprises carriers domiciled in Canada, including for-hire, private and government carriers. The for-hire sector, which accounts for about 75 per cent of total industry revenues, is selected for the financial performance analysis of the industry. It should be noted that CP Ships, because its vessels are registered in foreign countries and do not carry the Canadian flag, is excluded from the financial summary of the Canadian marine industry.

In 1995, Canadian-domiciled for-hire marine carriers reported total revenues of \$2.2 billion, of which about 68 per cent was from freight, four per cent from passenger transportation, 21 per cent from chartering services, and seven per cent from other revenue sources, such as subsidies and services incidental to water transportation. Figure 9-6 shows the breakdown of operating revenues of Canada's for-hire marine carriers in 1995.

In terms of total freight revenues, about 38 per cent are from domestic services and 62 per cent from international shipping.

Total revenues of Canadian for-hire marine carriers increased significantly in 1995, by an average of 13.5 per cent. Revenue growth was relatively strong in domestic freight transportation (up by 19 per cent), international freight services (12 per cent) and chartering services (21 per cent). Coastal shipping on the Atlantic side showed a 38 per cent increase in revenues, while there were only modest increases on the Pacific Coast, averaging about 1.4 per cent. Inland water transportation revenues and international freight revenues increased by seven per cent and four per cent, respectively. Overall industry revenue growth dropped due to a 14 per cent decline in other revenues.

#### **Cost Efficiency Indicators**

Marine is the least labour intensive sector within transportation: its labour costs represented in 1995 about 20 per cent of its operating revenues. The reason for this phenomenon is the trend toward using vessels chartered complete with their own crew and fuel. Such chartered activities account for 27 per cent of industry revenues.

From 1991 to 1995, labour productivity increased by 12 per cent. Some of these gains can be attributed to an increasing reliance on chartered vessels, which provided a substitute to internal labour. Unit labour costs have decreased by five per cent over the same period.

Fuel costs fell from 11 per cent of operating revenues in 1990 to nine per cent in 1995, due to

TABLE 9-13
PRODUCTIVITY AND UNIT COST CHANGES
IN MARINE TRANSPORT *

	1992	1993	1994	1995
Cost Structure (In % of Op. Rev.)				
Labour	24.2	20.9	20.8	20.0
Fuel	9.3	8.8	8.8	9.3
Chartering Cost	20.1	23.9	26.3	26.9
Employees (in 000)	8.8	7.7	8.5	8.7
Avg. Labour Cost in \$000	45.1	44.9	46.8	49.5
Productivity Change (in %)				
Labour	(10.0)	12.1	2.3	8.4
Total	(5.8)	1.6	0.9	2.8
Unit Cost Change (in %)				
Labour	8.4	(11.8)	1.8	(2.4)
Total	8.3	(0.5)	1.6	0.5
* revised data				
Source: Transport Canada based on Statistics Cana	ada files			

# TABLE 9-14 FINANCIAL HIGHLIGHTS OF THE MARINE INDUSTRY (Canadian-comiciled for-hire marine carriers)

\$million 1993 1994 1995 Operating Revenues 1,658 1,905 2.275 Operating Expenses 1.580 1.815 2,194 Operating Income 78 90 117 Operating Ratio (%) 95.3 95.3 94.6 Operating Margin Ratio (%) 5.4 4.7 4.7 706 Net Property 712 745 59.7 59.5 59.5 Debt Ratio (%)

some fuel efficiency gains.
Among other operating costs,
government fees represented an
important cost category, with a
share of seven per cent of
operating revenues in 1995.
Table 9-13 outlines the shipping
industry cost indicators from
1992 to 1995.

Source: Statistics Canada, Cat. 54-205

From 1991 to 1995, the shipping industry recorded the weakest productivity performance of all transport modes, its 1995

productivity slightly below its 1991 level. In the same period, total productivity of the transport sector grew by 11 per cent. Unit costs climbed ten per cent in marine transport, while they declined by five per cent for all modes.

#### **Profitability**

Table 9-14 presents a summary of the financial performance of the for-hire marine transport sector from 1993 to 1995.

<sup>1</sup> The relative importance of each factor input in the cost structure should be calculated in terms of total costs. But total costs include not only all operating costs, but also an allocation for the cost of capital. Measuring the cost of capital is a complex exercise and not all the information needed to measure it was available. Therefore total operating revenues were used in this report as a proxy for total costs under the assumption that net income is equivalent to the cost of capital.

The profitability of Canadian marine transport was modest in 1995, with an average operating margin 5.4 per cent of operating revenues, compared with 4.7 per cent in 1994. Strong revenue growth was somewhat offset by increases in operating expense.

#### **Investments**

Total net investment in the forhire marine transportation industry has not changed much since 1993. This indicates that the industry's annual capital investments merely offset depreciation and retirements of old assets. A shift to chartering rather than owning vessels may explain the relatively lower levels of capital expenditures in the marine industry as compared with other modes.

Long-term debt has been the single largest source of financing for capital assets in the marine industry, representing, on average, 60 per cent of total capital. Other sources of funds include equity, deferred taxes and other liabilities. The equity share in total capital (18 per cent), is relatively low because marine transportation often represents one of many business segments in a diversified corporation or a conglomerate, in which case, divisional equity funds are represented by retained earnings or reinvested capital. Deferred income taxes is also one of the important sources of capital funds in the marine industry, representing about 22 per cent of total capital.

# RAIL

The Canadian rail freight carriers reported increased traffic levels and improved profitability. In rail passenger services, the emphasis remained on cost reduction initiatives to face reduced subsidization.

Rail freight services in Canada are provided by two major Class I carriers, Canadian National Railways (CN) and Canadian Pacific Railway Company (CP). In addition to these, there are nominally some 54 smaller Class II and III railway companies. In practice, however, there are only about 46 railways, since some of these smaller ones are subsidiaries of CN, CP or other carriers and do not have separate and distinct operations. Class I railways are CN, CP and VIA Rail Canada Inc. (VIA). Class II railways include regional and shortline railways, while Class III railways include terminal railway operations.

Rail passenger services are offered by VIA, while more

localized or tourist services are provided by several other carriers, including BC Rail, Rocky Mountaineer, Algoma Central, Ontario Northland, Amtrak, and the Quebec, North Shore & Labrador (QNSL) Railway.

## Major Events in 1997

1997 was the strongest year in Canadian railway history. In aggregate, rail freight traffic levels increased by about seven per cent.

Severe weather conditions led to disruptions in rail transportation services to the West Coast in the early part of the year. These disruptions resulted in reduced traffic volumes of grain and coal (in particular during the first quarter) compared with previous years; however, volumes of these, and other commodities, rebounded quickly and by the year's end exceeded 1996 levels, in some cases significantly.

The disruptions to the grain handling system are currently under investigation by the Canadian Transportation Agency (CTA), and are not commented on here.

The year also saw a record number of lines transferred and new railways created, a response to the Canada Transportation Act of 1996,

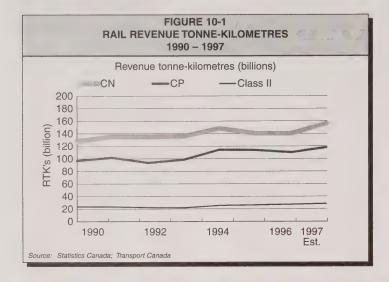


TABLE 10-1 DESTINATION OF IMPORTS FROM THE US BY RAIL 1995			
	Tonnes	· Per cent	
Nova Scotia	303,064	2.0	
New Brunswick	226,286	1.5	
Quebec .	4,984,994	32.4	
Ontario	6,040,936	39.2	
Manitoba	482,303	3.1	
Saskatchewan	716,374	4.6	
Alberta	1,275,414	8.3	
British Columbia	1,333,439	8.7	
NWT	27,783	0.2	
Total	15,390,673	100.0	
Source: Statistics Canada; Transpor	t Canada		

TABLE 10-2 ORIGIN OF EXPORTS TO THE US BY RAIL 1995				
	Tonnes	Per cent		
Nova Scotia	582,053	1.1		
New Brunswick	593,468	1.1		
Quebec	10,856,332	20.7		
Ontario	13,580,940	25.9		
Manitoba	1,378,257	2.6		
Saskatchewan	7,874,884	15.0		
Alberta	9,622,884	18.4		
British Columbia	7,957,418	15.2		
Total	52,446,547	100.0		
Source: Statistics Canada; Transport Canada				

which provided a revised rail-line rationalization process, eased the entry of smaller, lower cost rail carriers into operation, and encouraged the growth of a Canadian shortline industry. For a detailed discussion of changes in the structure of the rail industry, see Chapter 5, "Infrastructure and Associated Services."

## RAIL FREIGHT TRAFFIC AND SERVICES

In broad terms, rail traffic levels exhibited strong growth during 1997, with aggregate tonnage levels for the rail sector in general at historical highs. Overall traffic volumes (in tonnes) were more than seven per cent higher than in 1996 and about four per cent higher than in 1995. Many market segments showed significant gains.

In terms of aggregate revenue tonne-kilometre output, Canadian railways enjoyed their strongest year ever, exceeding previous record output levels set in 1994 by almost five per cent. CN and CP experienced increases in 1997 of 11.4 per cent and 7.1 per cent, respectively (estimated on the basis of three quarters of Canadian data and four quarters of system data), while Class II railways experienced an estimated increase of about 3.7 per cent. The combined result is an estimated gain of about 8.7 per cent across all Canadian railways.

CN accounted for about 51.6 per cent and CP for about 39.0 per cent of all railway output in Canada, while Class II and other railways accounted for the remaining 9.4 per cent. The much lower output in revenue tonne-kilometre terms by Class II railways compared with traffic volumes is largely due to the greater distances that traffic moved on the Class I carriers.

Figure 10-1 shows rail output in revenue tonne-kilometres from 1990 to 1997.

In tonnage terms, Class II carriers accounted for about 29 per cent of total tonnage handled by Canadian railways. The slight increases in traffic levels over previous years – 77 million tonnes in 1996 and 79 million tonnes in 1997 – were driven largely by increased volumes of iron ore being transported.

Virtually all iron ore transported in Canada is moved by Class II railways, the most prominent being two large regional carriers. While these railways represent an extreme, in that they move essentially only a single commodity, they illustrate the dominance of resource products in the traffic base of Class II carriers.

#### **TRADE**

In aggregate, rail traffic moving on the contiguous North American rail system (exclusive of the iron ore traffic in eastern Quebec) showed major changes over the previous year. From 1991 to 1995, north-south rail traffic increased at about seven per cent annually, with exports dominating imports by almost three to one. Data to confirm more recent trends is unavailable but, in light of the positive overall traffic growth evidenced in monthly traffic statistics, it is expected that the past trends of declining east-west traffic and increasing north-south traffic growth continued during 1997. Tables 10-1 and 10-2 illustrate the regional sources of north-south traffic.

East—west rail tonnages for 1995 were about 200 million tonnes (a figure that is unlikely to have changed more than marginally since), while north—south tonnages were about 70 million tonnes,

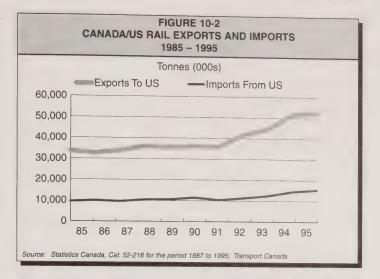


TABLE 10-3 RAIL EXPORTS TO THE US BY COM	MODITY
(In per cent)	
Forest products	29.5
Fertilizer materials	13.4
Grains	5.8
Intermodal traffic	5.2
Transportation equipment	4.6
Refined petroleum products	3.6
Construction materials	3.8
Sub-total	64.7
Other commodities	35.3
Source: Statistics Canada, Cat. 52-216; Transport Canada	

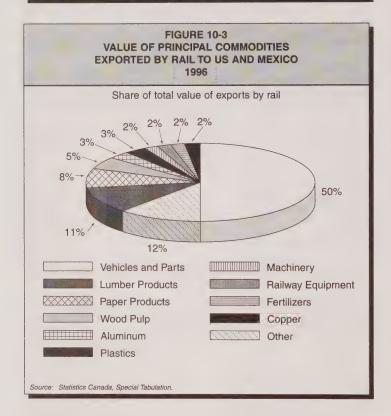
divided roughly as 52.4 million tonnes of exports to and 15.3 million tonnes of imports from the US.

A comparison of Canada–US trade for 1995 and 1985 reveals similar growth rates in both exports and imports. In 1995, rail exports to and imports from the US were about 22 and seven per cent of total rail tonnage; in 1985, exports to and imports from the US were 15 and five per cent.

Figure 10-2 highlights this pattern of growth in trade by rail with the US, particularly after 1990.

By volume, three commodity groupings - forest products, fertilizer materials and grain comprise about 50 per cent of rail exports to the US. Intermodal traffic, automobiles and parts, petroleum products and construction materials account for another 15 per cent of exports. Imports are more diversified, with the largest source of rail traffic from the US, intermodal, at slightly less than 15 per cent by volume. Tables 10-3 and 10-4 show the relative volumes of exports to and imports from the US by commodity.

TABLE 10-4 RAIL IMPORTS FROM THE US BY COMMODITY			
(In per cent)			
Intermodal traffic	13.9		
Transportation equipment	7.8		
Construction materials	5.3		
Forest products	3.8		
Non-ferrous metals	3.7		
Refined petroleum products	3.3		
Grains	2.8		
Sub-total	40.8		
Other commodities	59.2		
Source: Statistics Canada, Cat. 52-216; Transport Canada			



By value, rail exports to the US and Mexico in 1996 amounted to some \$50 billion. Vehicles and parts accounted for about \$25 billion (50 per cent) of this, while forest products generated about \$12.5 billion (25 per cent). Figure 10-3 illustrates the

commodities exported by rail to the US and Mexico. In light of the concentration of automobile and parts manufacturers in southern Ontario and Michigan, it is not surprising that the three major rail gateways in southern Ontario — Sarnia, Windsor and Fort Erie – accounted for almost 70 per cent of the value of all rail exports to the US. Intermodal traffic includes both containers and trailers transported on flat cars.

#### TRAFFIC SEGMENTS

Railway traffic can be categorized based on a variety of criteria, from commodity characteristics to market segments. For the purposes of this report, rail traffic has been grouped into three broad categories that reflect differences in transportation requirements, particularly operations and equipment: bulk, merchandise (including automotive) and intermodal. Bulk traffic includes coal, grain and grain products, and fertilizer materials, including sulphur. Merchandise traffic (i.e., industrial) includes forest products, petroleum products, chemicals, ores and metals, construction materials, and automobiles and parts. As noted earlier, intermodal traffic includes both containers and trailers transported on flat cars (i.e., Container-on-Flat-Car (COFC) and Trailer-on-Flat-Car (TOFC) traffic).

Demand for rail transportation services increased strongly across virtually all services and sectors during 1997. System congestion, associated with adverse winter weather conditions during 1996 – 1997, produced severe equipment shortages that, along with motive power failures, resulted in problems in moving traffic to the west coast.

Figure 10-4 illustrates the aggregate monthly traffic level from 1995 to 1997, and Figure 10-5 summarizes the change in traffic demand (i.e., volume) in each major traffic segment sector in 1996 and 1997 as compared with

the previous year. The following sections briefly discuss key traffic developments in the major segment sectors.

#### Coal

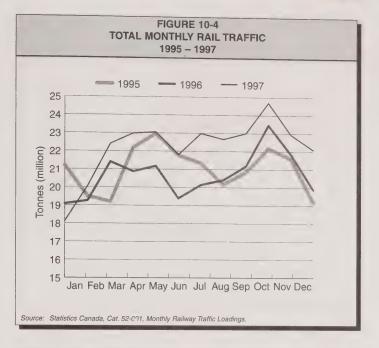
Some changes in demand patterns and loadings for coal occurred in 1997. At the beginning of the year, volumes were almost 30 per cent lower than those in 1996. Cumulative coal loadings in 1997 were more than four per cent ahead of the previous year's level. By the end of 1997, coal volume exceeded the previous year's volume of about 40.4 million tonnes by almost two million tonnes.

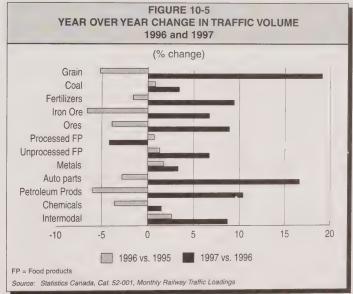
Aggregate coal tonnage moved by Canadian railways represented about 16 per cent of total railway volume for the year. Principal coal producers are located in Western Canada, with virtually all Canadian coal exports (33.4 million tonnes in 1996) moved by rail to export position through the ports of Vancouver and Prince Rupert. CN, CP and BC Rail are all involved in the transportation of coal. The balance of about 7.0 million tonnes (1996) was transported by rail, or in some cases a rail/laker combination, and used domestically for thermal generation of power in Ontario and Nova Scotia.

#### Fertilizer Materials and Sulphur

Fertilizers generally include potash, phosphate rock and blended fertilizer materials. Sulphur, produced largely as a by-product of sour gas and high-sulphur oil, is used principally in fertilizer production.

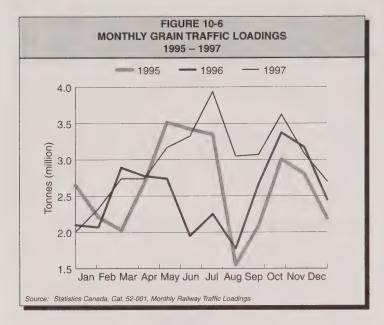
Potash in Canada is principally produced by a small number of high-volume mines in Saskatchewan, which accounted for 87 per cent of Canadian production in 1996. Much of this





is transported by rail to export position, either directly to the US or to offshore markets via Vancouver. Smaller volumes produced in New Brunswick are moved to the Port of Saint John for export. Potash shipments

through the Port of Saint John, which totaled 1.7 million tonnes in 1996, decreased to 1.2 million tonnes in 1997 as a result of a flooding problem at a major potash mine in the Sussex area.



Potash volumes tend to fluctuate annually, mainly because of its use in the agricultural sector and the varying demands of this sector for fertilizer materials. Demand for Canadian potash is influenced not only by end use but by the ability of other global suppliers to meet the demands of the agricultural sector. With a 40 per cent share of global markets, Canada is the largest potash exporter in the world. Volumes of potash transported by rail in 1997 are about 14.1 million tonnes.

Of particular concern to both the Port of Vancouver and Canadian railways is the completion of Canpotex's new potash terminal at Portland, Oregon, with a projected annual capacity of five million tonnes. Canpotex would no doubt be expected to use the facility to the extent necessary to rationalize the investment or to apply competitive pressure on Canadian railways and the Port of Vancouver. Since total potash tonnage moved through Vancouver for export was approximately 3.6 million tonnes

in 1996, the potential exists for the loss of significant quantities, if not all, of the potash moving through the port. The impact on rail traffic of such a diversion could be equally serious. The long haul business could go to US carriers and the short haul could conceivably be limited to the distance between Saskatchewan mine sites and the US border.

Sulphur production and shipments tend to be highly sensitive to world prices. Rail volumes totaled about 7.3 million tonnes in 1997, with significant export quantities produced in Western Canada, principally from sour gas processing and the refining of high-sulphur crude and heavy oils. With 22 per cent of world production, Canada was the second largest exporter of sulphur in the world in 1996, after the US.

Another fertilizer material moved by rail, phosphate rock, is imported via Vancouver. Volumes, however, are much lower than for potash, at about one million tonnes in 1997.

The total volume of fertilizer materials, including sulphur, shipped by rail was significantly ahead – about 11 per cent – of the previous year's total.

#### Grain

Aggregate rail volumes of grain for 1997 were 35.8 million tonnes, 13.5 per cent of total rail tonnage, compared with less than 12 per cent in 1996. Grain volumes were about four per cent below 1996 levels at the beginning of the year, but rebounded strongly by the end of the year to levels over 18 per cent higher than those in 1996.

While volumes in January 1996 were almost 20 per cent lower than in January 1995, the year ended with aggregate loadings only four per cent below 1995 levels. Loadings in 1997 exceeded loadings in both previous years by significant margins, even though they were considerably below previous levels at the beginning of the year. Total grain volumes at year-end are estimated to be 20 per cent ahead of 1996 year-end totals and ten per cent ahead of 1995 year-end totals. Figure 10-6 illustrates the volatility of monthly grain loading volumes from 1995 to 1997.

#### **Ores and Mine Products**

This segment is dominated by the shipment of iron ore, which represents about 65 per cent of all ores and mine products transported by rail in Canada and about 55 per cent of total Class II rail traffic.

Virtually all iron ore transported by rail in Canada (96 per cent in 1996) was transported by the Cartier and QNSL railways (in addition to several smaller railways associated with QSNL) from the Labrador Trough region of Quebec and Newfoundland. With the announcement by Algoma Steel that its Algoma Ore Division's Wawa operation will cease production, virtually all iron ore in the future will continue to be transported by these two railways and their affiliates.

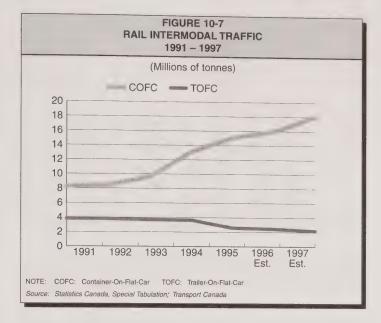
The Cartier and QNSL railways moved approximately 36 million tonnes of iron ore in 1997; that is over 50 per cent of all Class II traffic in Canada, and about 14 per cent of total rail tonnage. Following a start to the year that saw traffic levels for ores and mine products essentially the same as the previous year, volumes gradually improved to the point where, by the end of 1997, aggregate shipments were approximately 7.5 per cent higher than in 1996. The volume of iron ore transported was about 6.2 per cent ahead of the previous year.

#### **Forest Products**

Forest products, a broad commodity grouping that includes such products as paper, lumber and pulpwood, can be categorized into two sub-sectors: processed (e.g., lumber and paper) and unprocessed (e.g., logs and pulpwood).

Processed forest products moved by rail were among the few sub-sectors to show traffic declines in 1997, with volumes approximately four per cent lower than in 1996. Unprocessed forest products, on the other hand, showed substantial year-over-year increases of almost seven per cent, principally due to rising demand in US markets. In aggregate, the forest products sector experienced traffic increases of about three per cent over 1996 levels.

Both sub-sectors accounted for relatively similar levels of activity. Unprocessed forest products, however, represented about nine per cent of all rail movements (approximately 23 million tonnes),



while processed forest products represented some seven per cent (about 18 million tonnes). In aggregate, forest products moved by rail amounted to about 41 million tonnes, or about 16 per cent of total rail shipments.

## Industrial and Automotive Products

This broad market segment, which includes manufactured goods, petroleum products, metals, chemicals, etc., accounted for over 30 million tonnes in traffic volume, representing a moderate increase of about five per cent over the previous year and 12 per cent of overall traffic volume.

Volumes of chemicals were essentially stable, increasing by less than two per cent in 1997, while traffic of petroleum products increased significantly, with gains of more than 11 per cent over 1996 levels.

Automotive markets continued the growth trend experienced over the past several years, with exceptional growth, particularly in finished automobiles and parts, which saw a surge in traffic to levels almost 16 per cent higher than in 1996. Growth in automotive-related shipments has been one of the key factors behind the strong growth in Canada–US trade by rail over the past five years. Although relatively minor in terms of volume compared with the magnitude of the bulk category, automotive-related shipments dominate Canada–US trade by rail in terms of value.

#### Intermodal

In the aggregate, the intermodal segment of the rail sector continued its pattern of strong growth in 1997, with volumes increasing approximately eight per cent over the previous year. The continued slide of the Trailer-on-Flat-Car segment, with volumes dropping off by an estimated 11 per cent, was offset by the strong growth of the Container-on-Flat-Car segment, with an estimated increase of about 13 per cent. (Estimates for 1996 and 1997 were made on the basis of

\* Adjusted by traffic mix

Sources: Association of American Railroads; Transport Canada

TABLE 10-5 CANADA/US RAILROAD PRICE COMPARISON 1990 to 1995						
(Revenue in Cents per Tonne-Kilometre)						
	US in US \$					
1990	1.82	2.12	2.44			
1991	1.78	2.04	2.38			
1992	1.77	2.14	2.36			
1993	1.73	2.24	2.31			
1994	1.70	2.32	2.29			
1995	1.63	2.24	2.27			

TABLE 10-6 OUTPUT AND PRICE CHANGES IN RAIL FREIGHT 1994 – 1997					
	1994	1995	1996	1997*	
Price Changes	(5.4)	2.2	(1.2)	(1.1)	
Output Changes	17.3	(6.2)	1.6	9.6	
* Based on three quarters of year					
Source: Transport Canada, based on Statistics Canada files					

Statistics Canada's monthly traffic data in conjunction with Transport Canada's commodity flow data from previous years.) Figure 10-7 shows the changes in intermodal rail traffic from 1991 to 1997.

Although trailer traffic has been in gradual decline for more than a decade, container traffic has been reported as increasing consistently since the economic recession of the early 1990s. It was not until 1993, however, that container traffic recovered to the levels of the pre-recessionary peaks of 1988 and 1989.

The estimated aggregate increase in rail intermodal traffic since 1991 is slightly less than 55 per cent. This is the sum of an estimated 107 per cent increase in container traffic levels and an estimated 45 per cent decrease in trailer traffic levels. One of the factors influencing this overall growth has

been the performance of ports such as Halifax and Montreal, which have succeeded in capturing increasing amounts of traffic destined for US Midwest markets. CN's Gateway Intermodal Terminal, which opened in December 1996, contributed to the strong growth in rail intermodal traffic handled through the Port of Halifax. Container traffic at the Port of Halifax increased by 19.9 per cent in 1997, from 3.2 in 1996 to 3.8 million tonnes in 1997.

#### **PRICES**

Rail freight prices declined significantly in the late 1980s and early 1990s, with a major drop (5.4 per cent) in 1994. Market conditions enabled railways to increase domestic freight rates in 1995 by 2.2 per cent, but the industry returned to a pattern of rate decline in 1996 (1.2 per cent) and

1997 (1.1 per cent). (Table 10-6). In real terms, rail prices have fallen by 14 per cent between 1993 and 1996.

Average revenues generated per tonne-kilometre of freight traffic carried is often used as a proxy for rail freight rates. This unit of measurement, called "yield", was compared for US and Canadian railways for the period 1990 to 1995. The comparison revealed that the differences observed in 1990 had disappeared almost totally by 1995. Table 10-5 compares Canadian and US railways' yields from 1990 to 1995.

#### COMPETITION

Competition between the trucking and rail industries is significant for certain commodities and within certain regions. In aggregate terms, however, for-hire trucking and rail accounted for approximately 45 per cent and 55 per cent, respectively, of surface freight transportation tonnage in 1996.

Relative market shares have been undergoing gradual change for some years, with for-hire trucking increasing its share of the surface market at the expense of the rail industry. Figure 10-8 illustrates both traffic volumes and (for-hire) truck-rail modal share from 1990 to 1996. It shows the relatively strong growth in for-hire trucking and rail volumes as well as rail's declining share of the surface market.

There was relatively little truck-rail competition in either bulk commodity markets traditionally dominated by rail or time-sensitive, high-value or low-volume commodities traditionally dominated by trucking. There was, however, competition in selected manufactured, industrial and automotive commodities.

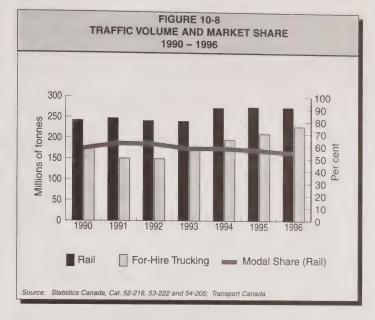
Competition in transborder markets is illustrative of trucking's dominance over rail, with exports to the US by truck accounting for about 70 per cent of shipments by value and about 55 per cent by volume.

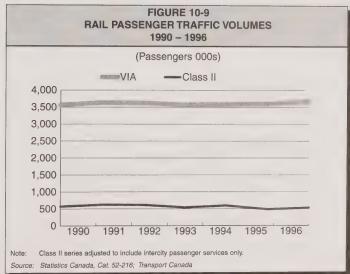
## RAIL PASSENGER TRAFFIC AND SERVICES

Although a number of rail carriers provide intercity passenger services in Canada, VIA dominates the market, carrying about 88 per cent of all intercity rail passengers. Its services are categorized by route: corridor, from Quebec City to Windsor; transcontinental, servicing the areas east and west beyond the Quebec-Windsor Corridor; and remote, including intercity lines in Quebec, Ontario, Manitoba and British Columbia, Corridor passenger volumes are significantly higher than those in either the transcontinental or remote services. accounting for about 83 per cent of VIA's traffic in 1996. Transcontinental services accounted for a further 13 per cent, while remote services accounted for the remaining four per cent.

Other carriers providing passenger services include BC Rail, the Algoma Central Railway, the Ontario Northland Railway, the QNSL Railway, Amtrak and the Rocky Mountaineer.

Intercity rail passenger volumes increased somewhat over 1996. This was due almost entirely to growth in VIA's traffic levels, which increased by slightly less than two per cent in 1996 and by almost six per cent in the first half of 1997. Aggregate volumes, however, saw relatively little change from 1990 to 1995.

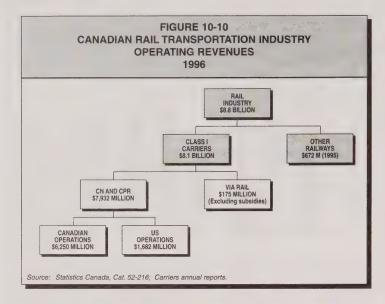


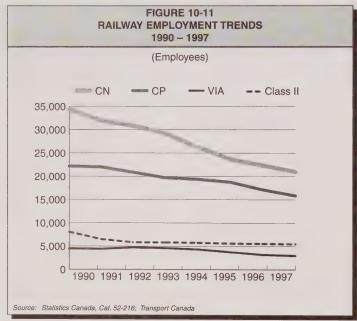


In addition to intercity rail passenger services, commuter rail services are offered in a number of metropolitan areas, including Vancouver, Toronto and Montreal. The number of passengers using such services are about eight times greater than intercity rail passenger traffic.

Figure 10-9 illustrates the trend in intercity rail passenger volumes over the past seven years.

Prices paid by users of VIA's services have increased at a faster pace than inflation. Based on preliminary 1997 data, VIA's prices went up by 6.1 per cent, compared to a 3.1 per cent increase in 1996.





## FINANCIAL PERFORMANCE

### FREIGHT CARRIERS

#### Highlights

The rail industry showed significantly higher profits during 1997. While this achievement can be explained in part by the improved performance of the Canadian economy, it can not be dissociated from the restructuring initiatives implemented by the two large Canadian rail carriers in recent years.

In 1997, the combined system operating income of the two major Canadian freight railways rose to \$1,479 million from \$1,141 million (excluding special charges) a year earlier, a 30 per cent increase. The average in operating profit margin was in the order of 18 per cent, an improvement of three percentage points from 1996. The main reasons for this improvement were higher export volumes, especially in grain shipments, which led to an eight per cent increase in freight revenues, and only three per cent increases in operating costs, due to strict cost control and productivity gains.

#### Revenues/Expenses

In 1996, total operating revenues of rail transportation in Canada were about \$7.2 billion. If the US operations of CN and CP are added, the total jumps to \$8.8 billion. The Canadian operations of CN and CP generated combined total operating revenues of \$6.2 billion, representing a 90 per cent share of rail freight revenues in Canada. Regional railways generated the remaining ten per cent.

In addition, CN's and CP's US operations generated about \$1.7 billion, which accounted for 21 per cent of their combined system revenues of \$7.9 billion. In 1996, about 14 per cent of CN's revenues were earned from its US operations, compared to 29 per cent for CP.

Figure 10-10 charts operating revenues in the Canadian rail transportation industry in 1996.

The operating expenses of railways consist mainly of labour, fuel, depreciation, equipment rentals, and other materials and services.

Reductions in labour costs have been the largest contributing factor to higher operating profit margins in recent years. In 1996, the share of labour costs in total operating revenues was 35 per cent, down from 47 per cent in 1993. In comparison, the US Class I railways still have relatively lower labour costs, with the labour cost share of total operating revenues at 28 per cent in 1996.

While CN, CP and VIA all experienced estimated labour reductions of six to seven per cent during 1997, labour reductions over the past five years have varied by carrier. During the 1992 – 1997 period, CN experienced a reduction of about 32 per cent, CP a reduction of some 24 per cent, and VIA a reduction of about 38 per cent. Figure 10-11 illustrates the trend in Canadian railway employment since 1990.

While long-established Class II carriers have tended to reduce the labour content of their operations, employment in Class II railways

overall has not come down as significantly, a situation partly due to the transfer, in recent years, of lines and some employees from Class I to Class II railways.

Rail operations used to be more labour intensive than the overall transportation sector. In 1992, labour costs represented 50 per cent of CN and CP combined operating revenues, but only 41 per cent of transportation in general. In 1997, labour costs for rail were down to 35 per cent, almost equivalent to that of the total transportation sector.

Rail labour productivity increased by 47 per cent over the 1992 – 1995 period – much more than the 28 per cent improvement in the entire transportation sector – and by nine per cent in 1996. Based on preliminary data, 1997 also showed further gains.

The strong productivity gains must be tied to higher average annual labour costs in the rail transportation industry, \$61,000 in 1996 compared with \$45,000 for all transportation. While phenomenal productivity improvements were achieved, average labour costs per employee also increased. Unit labour costs at CN and CP have declined by 25 per cent since 1992, allowing CN and CP to shave \$720 million from their total labour costs. Comparatively, unit labour costs in the overall business sector increased by 0.4 per cent over the same period.

Rail fuel costs represented 9.5 per cent of operating revenues for CN and CP in 1996, compared with 12 per cent for the transportation sector as a whole. Since 1992, fuel efficiency in CN's and CP's operations has improved significantly.

Operating expenses other than fuel and labour accounted for 47 per cent of CN and CP operating revenues in 1996. Other costs were related to the use of capital. Municipal taxes, leasing and depreciation accounted for around 15 per cent of the railways' revenues. The share of equipment rentals was six per cent, about the same as depreciation.

Total factor productivity of the Canadian railway industry improved by 24 per cent from 1992 to 1996, with a 3.7 per cent gain in 1996. The most important source of total productivity gain in Canadian railways continues to be labour productivity. As a result of strong productivity gains, unit costs have declined by 18 per cent since 1992. In 1996, the drop in unit costs reached 2.7 per cent. Lower unit costs have allowed the railways to both reduce prices and improve their financial performance from the returns of the early 1990s.

Table 10-7 lists cost and efficiency indicators of Canadian railways.

#### **Profitability**

Canadian railways have shown significant improvements in financial performance in recent years. In the Canadian operations of rail freight, the industry average operating margin almost tripled, from 6.9 per cent of revenues in 1993 to 20.2 per cent in 1997. Table 10-8 presents highlights of the Canadian railway industry's financial performance for the period 1993 to 1997.

<sup>1</sup> The relative importance of each factor input in the cost structure should be calculated in terms of total costs. But total costs include not only all operating costs, but also an allocation for the cost of capital. Measuring the cost of capital is a complex exercise and not all the information needed to measure it was available. Therefore total operating revenues were used in this report as a proxy for total costs under the assumption that net income is equivalent to the cost of capital.

TABLE 107 COST STRUCTURE AND EFFICIENCY INDICATORS CN AND CP, 1993 TO 1996						
	1993	1994	1995	1996		
Cost Structure (In % of Op. Rev.)						
Labour	47.3	40.8	42.7	39.1		
Fuel	8.8	8.7	9.2	9.5		
Employees (in 000)	48.9	45.6	42.4	39.4		
Avg. Labour Cost (in \$000)	57.1	57.4	61.7	61.0		
Productivity Change (in %)						
Labour	9.1	22.9	0.4	9.1		
Fuel	3.3	9.8	(5.7)	5.2		
Total	5.5	12.2	0.6	3.7		
Unit Cost Change (in %)						
Labour	(5.7)	(18.1)	7.0	(9.3)		
Total	(5.3)	(11.4)	0.9	(2.7)		
Source: Transport Canada, based on Canadian Transportation Agency files						

TABLE 10-8						
FINANCIAL PERFORMANCE HIGHLIGHTS OF CANADA'S RAIL TRANSPORT INDUSTRY						
1993 – 1997						
(\$ million)						
	1993	1994	1995	1996	1997	
Class I Freight Carriers						
Canadian Operations						
Operating revenues	5,894	6,426	6,190	6,250	6,528	
Operating expenses <sup>1</sup>	5,530	5,635	5,592	5,346	5,208	
Operating margins (%)	6.2	12.3	9.7	14.5	20.2	
System (Including US Operations)						
Operating revenues	7,366	7,970	7,877	7,932	8,295	
Operating expenses <sup>1</sup>	6,919	7,236	7,055	6,791	6,816	
Operating margins (%)	6.1	9.2	10.4	14.4	17.8	
Special charges	49	0	2,596	381	0	
Regional Carriers/Operators						
Operating revenues	629	644	672	N/A	N/A	
Operating expenses	535	540	560	N/A	N/A	
Operating margins (%)	13.5	17.1	12.7	N/A	N/A	
Total Rail Freight - Canadian Operations						
Operating margins (%)2	6.9	13.6	10.0	14.5	20.2	
N/A Not Available  1. Excluding special charges for restr						

Industry operating margin ratios in 1996/1997 are represented by CN and CP averages

On a system basis, the profits of both CN and CP increased significantly in the last two years. In 1996, the two railways' combined system total operating income (excluding special charges) amounted to \$1.1 billion, an increase of 39 per cent over 1995. Combined net profit rose to \$529 million in 1996 as opposed to a total loss of \$2 billion in 1995, which was due to special charges for organization restructuring and write-down of assets. The two railways again showed significant increases in profits in 1997, with a combined system operating income of \$1.5 billion, up 30 per cent from 1996.

#### **Canadian National Railway**

Since its privatization in 1995, CN has been successful in the capital markets, due mostly to its improved profitability. From 1993 to 1997, CN's operating margins have more than tripled, from five per cent of operating revenues in 1993 to 18.5 per cent in 1997. Despite this improvement in operating margins, however, net profits were significantly affected in 1995 and 1996 by special charges associated with restructuring and asset revaluation. These charges amounted to \$1,453 million in 1995 and \$381 million in 1996.

The benefits of restructuring started to show in 1997, with sharp increases in operating income from \$610 million in 1996 to \$807 million in 1997. The higher profitability was attributable to labour productivity gains, lower overall unit costs, and strong growth (9 per cent) in total operating revenues. This growth in total operating revenues resulted mainly from higher traffic volume in grain, automotive and intermodal traffic. Net income was

Source: Statistics Canada, Cat. 52-216; Annual Reports of CN and CPR

\$421 million in 1997, up from \$296 million in 1996.

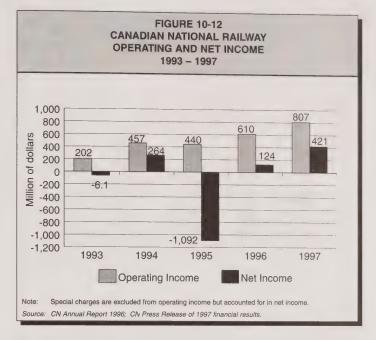
Figure 10-12 plots CN's operating and net incomes from 1993 to 1997.

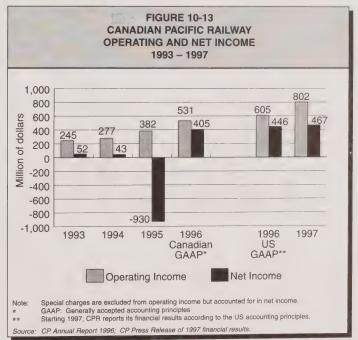
#### Canadian Pacific Railway

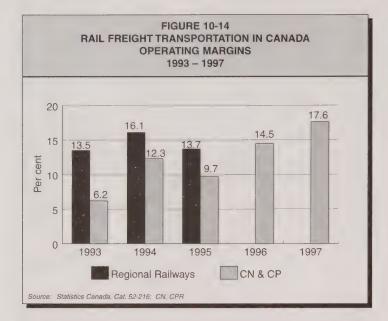
CP Rail's profitability also significantly improved in recent years, with operating margins doubling from 7.2 per cent of revenues in 1993 to 17 per cent in 1997.

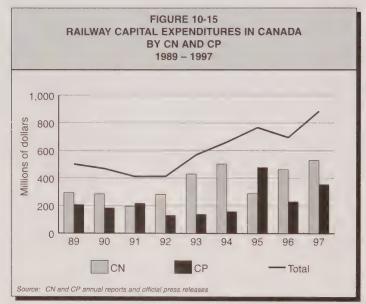
In 1995, the railway underwent a major organizational restructuring program, which incurred a special charge of \$1,143 million and a net after-tax loss of \$930 million. Following cost reductions and restructuring. however, its operating ratio declined to 86 per cent in 1996 from 90 per cent in 1995. Even though revenue growth was flat in 1996, operating income increased to \$531 million, up 39 per cent from \$382 million in 1995 (excluding special charges) due to the improvement in operating ratio. Figure 10-13 shows CP's operating and net incomes from 1993 to 1997.

In 1997, CP started to report its financial results under the US accounting principles (USGAAP). Under this approach, CP's profitability was higher, with an operating margin ratio at 21.5 per cent of total revenues. CP's system total operating income was \$802 million in 1997. If adjusted for the Kansas City and Corn Line sale, CP's freight revenues grew by seven per cent in 1997, mainly because of increases in grain shipments, coal, sulphur, fertilizers, intermodal and automotive traffic.









### **Regional Carriers**

The average operating profit margin of regional carriers was higher than that of national carriers from 1993 to 1995, a period in which both CN and CP were undertaking major restructuring of their operations.

Regional carriers' services are essential to local industries, particularly in the mining and natural resources sectors. As such, these carriers' profitability is closely related to the performance of their clients. For example, BC Rail's profits were affected by lower production levels of the forest and coal industries in 1996.

RaiLink, a rail shortline operator, became a publicly traded company on April 1, 1997. RaiLink became profitable in 1997, reporting \$11 million in operating revenues and \$2.5 million in operating income in the first half of 1997, with an operating ratio of 76.8 per cent (or an operating margin of 23.2 per cent). Its net income for the six months was \$1.3 million, compared with a loss of \$0.5 million for the corresponding period in 1996, when the operating ratio was 91 per cent. Figure 10-14 illustrates operating margins for rail freight carriers from 1993 to 1997.

#### **Investments**

Both CN and CP have increased capital expenditures since 1993, mostly on new locomotives, to improve efficiency and customer services.

In 1996, capital expenditures of the two main railways' Canadian operations totaled \$694 million. CN's capital expenditures, \$464 million, mainly included the acquisition of new locomotives,

<sup>2</sup> BC Rail Annual Report, 1996.

additions to rolling stock and other equipment, and roadway renewal. CP's capital expenditure level was down in 1996, following the acquisition of a significant number of locomotives in 1995. Figure 10-15 shows CN's and CP's capital expenditures from 1989 to 1997.

The two major railways significantly increased their capital expenditures in 1997 with a combined system total amount of \$1.4 billion, of which about \$884 million was invested in their Canadian operations. Their investment programs in 1997 were still focused on new high-horsepower locomotives.

At the end of 1996, total net fixed assets of CN and CP amounted to \$10.1 billion, including \$492 million held under capital lease. Property investments consisted of 65 per cent track and roadways, 22 per cent rolling stock, six per cent buildings and seven per cent other properties. About 93 per cent of CN assets were in Canada, with the remaining seven per cent in the US, while CP had relatively more investments in the US, about 28 per cent. Table 10-9 compares railway net fixed assets as of the end of 1996.

### VIA RAIL

Passenger revenues from VIA operations (excluding subsidies) accounted for two per cent of total industry revenues. In 1997, VIA generated total operating revenues of \$188 million, an increase of 7.4 per cent from 1996.

Although rail passenger services are still subsidized, the cost recovery ratio has significantly increased in recent years, from 33.8 per cent of total operating

TABLE 10-9 RAILWAY NET FIXED ASSETS AS OF DECEMBER 31, 1996						
(\$ Million)						
	CN	CP	TOTAL			
Track and roadways	3,314	3,267	6,581			
Rolling stock	979	1,211	2,190			
Buildings	336	299	635			
Other	240	470	710			
Total	4,869	5,247	10,116			
Capital leases included in properties	282	210	492			
Source: CN and CP Annual Reports, 1996						

	TABLE 10-10 FINANCIAL PERFORMANCE HIGHLIGHTS OF VIA RAIL PASSENGER INDUSTRY 1993 – 1997							
millio	n)							
993	1994	1995	1996	1997				
164	176	175	185	188				
485	439	397	390	387				
33.8	40.2	43.9	47.3	49.4				
348	318	295	245	229				
	993 164 485 33.8	164 176 485 439 33.8 40.2	993     1994     1995       164     176     175       485     439     397       33.8     40.2     43.9	993     1994     1995     1996       164     176     175     185       485     439     397     390       33.8     40.2     43.9     47.3				

expenses in 1993 to 49.4 per cent in 1997. Total government subsidies to VIA were \$229 million in 1997: \$196 million in operating funding and a total of \$33 million for capital funding and reorganization charges. These funds are based on the annual operating budgets approved by the government.

Since 1993, the subsidy to VIA has declined by \$119 million. The downward trend is expected to continue, as VIA has set its financial goals to further reduce total subsidies to \$170 million by 1999 through cost reductions and revenue growth strategies. Table 10-10 shows VIA Rail revenues, expenses and government funding from 1993 to 1997.

VIA's labour costs fell by \$71 million between 1992 and 1996. At 42 per cent in 1996, the labour share of operating revenues was down five percentage points since 1992. Between 1992 and 1996, strong productivity gains of 47 per cent were observed. The average annual labour cost per employee at VIA is the second highest in the transport industry. Unit labour costs fell 28 per cent over the period.

In 1996, fuel costs represented 4.4 per cent of VIA's operating revenues. From 1993 to 1996, fuel costs increased as a result of higher fuel prices and slower efficiency gains. Another major cost item is marketing (12 per cent).

TABLE 10-11 COST STRUCTURE AND EFFICIENCY INDICATORS OF VIA RAIL 1993 – 1996						
	1993	1994	1995	1996		
Cost Structure (In % of Op. Rev.)						
Labour	44.6	45.1	44.2	41.8		
Fuel	2.8	3.3	3.6	4.4		
Employees (in 000)	4.6	4.3	3.8	3.2		
Average Labour Cost per employee (\$000)	51.9	50.9	51.3	56.5		
Productivity Change (in %)						
Labour	0.9	7.8	15.5	17.2		
Fuel	2.7	4.3	10.5	(6.1)		
Unit Cost Change (in %)						
Labour	0.7	(11.7)	(10.9)	(8.9)		
Total	2.6	(10.0)	(11.0)	(8.0)		
Source: Transport Canada, based on VIA data files						

TABLE 10-12 OUTPUT AND PRICE CHANGES IN VIA RAIL 1994 – 1997								
	1994	1995	1996	1997				
Price Changes	5.0	(2.1)	3.1	6.1				
Output Changes	1.6	2.5	(0.7)	1.6				
Source: Transport Canada, based on	Source: Transport Canada, based on VIA data files.							

Depreciation and payments to other rail carriers each accounted for ten per cent of VIA's operating costs.

Table 10-11 lists the cost and efficiency indicators of VIA for 1993 to 1996.

In keeping with the reduction of subsidies, VIA's price increases have exceeded general inflation trends, except for a hiatus in 1995. In the past two years, VIA prices rose annually by 4.6 per cent against 1.7 per cent in the economy. In spite of these increases, VIA's output has been growing, albeit at a slower pace (Table 10-12).

## TRUCKING

A review of the *Motor Vehicle Transport Act* was initiated. Despite an increase in trucking bankruptcies, the industry's financial performance remained positive, driven by traffic increases mostly in transborder activities.

All Canadians encounter trucking in their daily lives in one way or another. Trucking accounts for significant revenues and jobs across Canada. Estimates suggest trucking is a \$31 billion industry and the for-hire sector accounts for nearly half of it. For-hire trucking activities produce approximately 158,000 jobs. Virtually every product a consumer purchases has been transported by truck at least part of the way, sometimes several times before reaching a final destination.

Trucking is popular because it is a flexible mode of transport, constrained only by the extent of the road network. Because of this flexibility, trucking can provide the kind of service required by even the most demanding shippers.

Approximately 118,000 large trucks in Canada haul freight commercially in for-hire operations. Non-commercial trucking operations use farm, utility and service trucks. The courier business that transports mail and small packages also uses trucks.

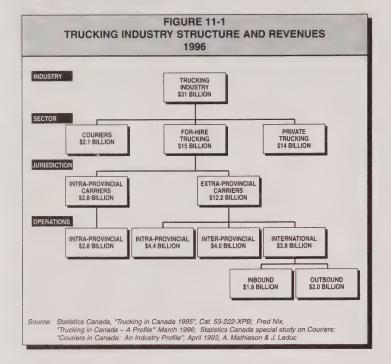
Figure 11-1 shows the industry structure and its revenues.

## Major Events in 1997

## REVIEW OF THE MOTOR VEHICLE TRANSPORT ACT, 1987

Transport Canada started a review of the *Motor Vehicle Transport Act, 1987* in 1996. The Act allows the provinces to regulate extra-provincial motor carrier (bus and truck) activities that are under federal jurisdiction.

During consultations in 1996, the provinces and industry associations agreed that government should focus on regulating carrier safety



and eliminating the last traces of economic regulation in the industry.

The department released a discussion paper in April 1997 that evaluated the results of these consultations and suggested areas requiring changes in the Act.

#### **NAFTA**

Two NAFTA groups, the Land Transportation Standards Subcommittee and the Transportation Consultative Group, continued to work toward compatible technical standards and to eliminate barriers to efficient cross-border truck traffic in Canada, Mexico and the US.

To date, the groups have arrived at compatible North American standards for driver age, language and medical requirements; issued a trilingual North American emergency response guide and a trilingual guide to traffic control devices; and published a report on North American vehicle weight and dimension compatibility.

The groups are now focusing on the motor carrier safety assessment process, exchanging motor carrier data, agreeing on vehicle weight and dimension compatibility, and developing a North American dangerous goods code.

## AMENDMENTS TO CABOTAGE RULES

Following several years of discussion, Canadian and US government and industry representatives liberalized customs rules governing equipment cabotage, or point-to-point movements in a foreign country, giving trucking companies freedom to use equipment more efficiently and to reduce the number of "empty miles" driven.

Under the new rules, as long as the cargo is international, the equipment will also be considered international and free from cabotage restrictions. Cabotage restrictions on equipment moving without payload will also be ended.

In addition, the US is considering liberalizing its rules on "incidental" movements – the pickup and delivery of domestic cargo during an international movement – to bring them into line with Canada's rules. Canada currently permits domestic pickup and drop-off, provided that the domestic shipment is secondary to the international shipment, and that the route taken for the domestic load does not deviate substantially from the route for the international cargo.

Existing immigration rules governing drivers are not affected by these changes.

## CANADA'S INTERNAL TRADE AND NATIONAL HARMONIZATION

The transportation chapter in the agreement on Internal Trade, which came into force in 1995, contains a general commitment to harmonize both standards and regulations, as well as specific commitments to implement national motor carrier safety standards, set uniform vehicle weight and dimension limits, and complete the deregulation of the trucking industry, among other issues.

#### **Second Annual Report**

In 1997, federal and provincial transportation ministers fulfilled their commitment under the agreement by submitting their second annual report on the implementation of commitments in the Internal Trade Agreement's transportation chapter.

In the report, they noted several highlights for the year. A

memorandum of understanding was signed, for example, containing nine recommended changes in national standards to make vehicle weights and dimensions more uniform. The proposals reflected current usage - conditions and changes that jurisdictions are willing to make. Work also started on an initiative to implement the new National Safety Code Compliance Review - Safety Rating Standard (Standard 14) in 1998, which will be the key component of proposed new federal motor carrier legislation in an amended Motor Vehicle Transport Act (MVTA).

## Repeal of Part III of the Motor Vehicle Transport Act, 1987

The repeal of Part III of the *Motor Vehicle Transport Act* was scheduled for early 1998 as part of the overall agreement to eliminate the last pockets of economic regulation in trucking. Negotiations on the repeal constituted the major internal trade-related initiative affecting trucking in 1997.

When the Agreement was signed, four provinces maintained some degree of economic regulation in trucking: British Columbia, Saskatchewan, Manitoba and Ouebec. Most of this regulation has been or was slated to be eliminated by January 1, 1998. British Columbia and Quebec, however, requested a delay in implementing the Part III repeal to allow their dump trucking and logging transport industries time for transition. These sectors represent less than two per cent of the industry nationally. The two provinces negotiated with the other provinces and territories on this issue. The majority of the other provinces agreed to the delay.

On December 21, 1997, the Minister of Transport agreed to postpone the repeal of Part III until January 1, 2000, as long as British Columbia and Quebec continued to regulate only dump trucking and logging transport.

## VEHICLE WEIGHTS AND DIMENSIONS

Vehicle weights and dimensions have a profound effect on trucking cost, productivity and competitiveness. Because of this importance, an interjurisdictional task force, the Task Force on Vehicle Weights and Dimensions, co-ordinates policy through collective action and acts as a forum for the exchange of ideas on provincial initiatives.

In 1997, the task force consulted with industry stakeholders to assess whether greater national uniformity in vehicle weight and dimension regulations would be feasible. They came up with 16 recommendations, nine of which were approved by the Council of Deputy Ministers Responsible for Transportation and Highway Safety, to which the task force is accountable. Provincial officials are still analysing the remaining seven recommendations.

The approved recommendations standardize dimensions for box length, tractor-trailer connections, spacing between axles and axle load limits. Some reflect current usage and conditions, while others represent changes that jurisdictions are willing to make to promote uniformity.

On the North American front, a trilateral working group is examining the standards governing the weights and dimensions of vehicles in Canada, the US and Mexico. Compatibility of vehiclesize characteristics presents a major challenge given the wide range of technical, economic and policy issues that underlie regulations in each country. The group has exchanged information on existing federal, state and provincial restrictions; discussed safety; and reviewed applicable compliance, enforcement and administrative procedures. It issued a report in September 1997 that outlines the issues involved in compatibility and presents options to explore in the future.

## TRUCKING SERVICES

The trucking industry can be divided into two major components: private trucking and for-hire trucking. Private trucking companies maintain a fleet of trucks and trailers to haul their own goods, occasionally using their fleets to haul goods for others. For-hire trucking companies carry freight for a fee under various service types, principally truckload and less-than-truckload.

In addition to servicing domestic and international demand, for-hire carriers can be further differentiated according to where they work in Canada. Intraprovincial for-hire carriers operate within a province and under provincial jurisdiction. Extraprovincial for-hire carriers operate beyond provincial and national boundaries under federal jurisdiction. Extra-provincial carriers derive a significant portion of their income from intraprovincial operations. In 1996, extra-provincial carriers generated over \$12 billion, which accounts for 81 per cent of total for-hire trucking revenues. Intra-provincial carriers accounted for the remaining 19 per cent, estimated at \$2.8 billion.

Owner-operators and couriers are also important components of the trucking industry. Owneroperators work under contract for either for-hire or private carriers, customarily using their own trucks. Couriers specialize in the delivery of mail and small packages, often enlisting other transporters, including inter-city bus companies, air cargo operators and less-thantruckload truck operators. Most of this chapter is devoted to for-hire trucking, as there is only limited information available on private trucking, owner-operators and couriers.

All carriers, whatever their category, differ according to operating characteristics, such as size, specialty equipment, geography, services and alliances. Companies range, for example, from the single unit owner-operator to large firms operating several thousand power units.

Some carriers use specialized equipment, such as logging trucks, hopper-bottom grain trailers and cement mixers, while others use general purpose vans or flat-deck trailers. Some carriers operate locally within a province, while others cross borders into other provinces and other countries. And some carriers handle general freight in one region only, while others "inter-line" with carriers in other regions.

Other distinctions in the industry differentiate carriers by the category of freight they carry:

- general freight carriers handle many different kinds of freight in vans and general-freight trailers;
- household goods carriers use specialized trailers to transport furniture and other personal household possessions;

- liquid bulk carriers use tanker trucks to transport liquids, such as milk, petroleum and chemicals;
- dry bulk carriers use dump or hopper-bottom trailers to haul goods, such as grain, fertilizer and gravel;
- forest products carriers use special logging trucks to transport logs from forests to mills;
- auto haulers use special trailers to transport cars and trucks from factories to car dealerships; and
- couriers use a variety of transportation modes to transport mail and small parcels.

General-freight carriers are by far the most numerous, accounting for approximately 50 per cent of the carriers.

### **GRAIN TRANSPORTATION**

The elimination of rail transportation subsidies and the consolidation of elevator and rail branch-line services have increased the use of trucks to haul grain in Western Canada. The expansion of secondary processing activities, such as milling, meat processing and canola crushing, and the increase in market opportunities in the US and the Asia Pacific region are also factors.

A study by Trimac Consulting Services Ltd. (Review of Grain Transportation by Truck in Western Canada), looked at the 48 million tonnes of grain produced in Western Canada during the 1995/96 crop year. Local trucking over short distances from farms to nearby elevators, inland terminals and rail sidings for local seeding or animal feeding requirements moved approximately 43.5 million tonnes, or 90.5 per cent of total grain production in that year.

Trucking is also used to carry grain from farms, primary elevators and inland terminals to other inland terminals and a variety of processing locations. Approximately 8.1 million tonnes of grain, or 17 per cent of 1995/96 grain production total, was shipped over intermediate distances of less than 800 kilometres. Such intermediate distance trucking tends to be in larger combination trucks and on a for-hire basis. The Trimac study also projected significant growth in intermediate trucking on the assumptions of more secondary processing activity in Western Canada and greater access to US markets.

Long-distance grain trucking over distances greater than 800 kilometres is rare because it is prohibitively expensive.

## TRAFFIC

## DOMESTIC VS. INTERNATIONAL

Truck traffic, as measured by the number of tonne-kilometres, has increased steadily since 1992 in both the domestic and international markets. Domestically, tonnekilometres have increased by approximately 50 per cent, while internationally, they have almost doubled, increasing by 98 per cent. As a result of these increases, the relative traffic share between domestic and international markets has been shifting. Since 1989, the domestic share of tonne-kilometres has decreased by more than 11 per cent, while the international share has increased by a corresponding amount, Table 11-1 shows the distribution of tonnekilometres by sector from 1990 to 1996.

	DISTRIBUT	TION OF TR	BLE 11-1 UCK TRAFF 0 - 1996	IC BY SEC	TOR		
Millions of tonne-km	1990	1991	1992	1993	1994	1995	1996
Intra-provincial	23,849.9	19,736.4	20,934.4	22,644.4	25,838.1	27,221.0	29,378.5
Inter-provincial	30,851.0	27,976.7	26,822.9	29,333.0	34,307.5	38,585.2	42,127.1
Total domestic	54,700.2	47,709.5	47,753.0	51,977.4	60,145.3	65,806.2	71,505.6
Southbound	13,528.9	13,191.9	15,276.4	19,478.4	23,989.1	25.846.5	29,277.1
Northbound	9,540.9	9,719.2	9,913.5	13,157.4	17,737.2	18,358.1	20,350.2
Total international	23,069.8	22,911.1	25,190.0	32,635.8	41,726.3	44,204.7	49,627.3
Total domestic & international	77,770.0	70,620.6	72,943.0	84,613.3	101,871.7	110,010.9	121,132.9
Sector share		İn	per cent				
Intra-provincial	30.7	27.9	28.7	26.8	25.4	24.7	24.3
Inter-provincial	39.7	39.6	36.8	34.7	33.7	35.1	34.8
Total domestic	70.3	67.6	65.5	61.4	59.0	59.8	59.0
Southbound	17.4	18.7	20.9	23.0	23.5	23.5	24.2
Northbound	12.3	13.8	13.6	15.6	17.4	16.7	16.8
Total international	29.7	32.4	34.5	38.6	41.0	40.2	41.0
Total domestic & international	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Source: Statistics Canada, Cat. 53-222 an	d 50-002						

TABLE 11-2 FOR-HIRE TRUCKING ACTIVITY REVENUES BY COMMODITY GROUP 1996						
Commodity group	Domestic (millions)	Per cent	International (millions)	Per cent	Grand total (millions)	Per cent
General freight	\$ 2,552.7	40.6	\$ 1,757.7	46.3	\$ 4,310.4	42.7
Food and food products	1,119.9	17.8	454.3	12.0	1,574.2	15.6
Forest products	872.0	13.9	599.4	15.8	1,471.4	14.6
Manufactured end products	424.7	6.8	293.7	7.7	718.4	7.1
Chemical products	383.8	6.1	194.6	5.1	578.5	5.7
Petroleum products	344.3	5.5	26.8	0.7	371.1	3.7
Motor vehicles, engines and parts	285.7	4.5	398.7	10.5	684.4	6.8
Non-metallic minerals	205.4	3.3	42.3	1.1	247.7	2.5
Grains	80.2	1.3	25.9	0.7	106.1	1.1
Metallic ores	19.2	0.3	4.6	0.1	23.8	0.2
Total revenues	\$ 6,287.9	100.0	\$ 3,798.1	100.0	\$10,086.0	100.0

## TRUCK TRAFFIC BY COMMODITY GROUP

In 1996, general freight, which consists primarily of manufactured products and fabricated materials, accounted for the majority of truck traffic, domestically and internationally, with 41 per cent of

all domestic and 46 per cent of all international freight transported. The next most important commodities were food products, followed closely by forest products. Table 11-2 shows the revenues that Canadian for-hire carriers generated by commodity in 1996.

General freight, food products and forest products also accounted collectively for over 70 per cent of the carriers' total tonne-kilometres in 1996. Table 11-3 gives the distribution of tonne-kilometres by commodity.

TABLE 11-3
FOR-HIRE TRUCKING TRAFFIC BY COMMODITY GROUP
1996

(Million tonne-kilometres)								
Commodity group	Domestic	Per cent	International	Per cent	Grand Total	Per cent		
General freight	22,823.9	31.9	18,419.6	37.1	41,243.5	34.0		
Forest products	13,877.2	19.4	11,598.1	23.4	25,475.4	21.0		
Food and food products	13,244.1	18.5	7,546.3	15.2	20,790.5	17.2		
Manufactured end products	5,917.0	8.3	4,193.7	8.5	10,110.7	8.3		
Petroleum products	5,245.1	7.3	547.0	1.1	5,792.0	4.8		
Chemical products	4,151.0	5.8	2,659.1	5.4	6,810.1	5.6		
Non-metallic minerals	3,196.3	4.5	733.8	1.5	3,930.2	3.2		
Grains	1,355.0	1.9	611.6	1.2	1,966.6	1.6		
Motor vehicle, engines and parts	1,346.7	1.9	3,230.6	6.5	4,577.3	3.8		
Metallic ores	349.4	0.5	87.4	0.2	436.8	0.4		
Total tonne-km	71,505.7	100.0	49,627.3	100.0	121,133.0	100.0		

Source: Statistics Canada, Special Tabulation.

# TABLE 11-4 DISTRIBUTION OF TRUCKING ACTIVITY BY TRAVEL SECTOR

Characteristic:	Activity Measured in Terms of:						
Travel sector	Number of trips	Ďistance traveled	Cargo tonnage	Cargo output*			
Intra-provincial	66.8	39.2	60.4	33.7			
Inter-provincial	13.7	39.6	17.9	45.7			
Transborder	18.8	20.3	21.0	19.8			
Transiting	0.7	1.0	0.7	0.9			
Total	100.0	100.0	100.0	100.0			

<sup>\*</sup> Cargo output is a representation of work done on a trip, and is calculated as the weight of cargo carried times the distance the cargo moves

Source: Transport Canada

# TABLE 11-5 DISTRIBUTION OF TRUCK TRAFFIC BY TYPE OF CARRIAGE

Characteristic:	Characteristic: Activity Measured in Terms of:						
Type of activity	Number of trips	Distance traveled	Cargo tonnage	Cargo output*			
For-Hire	68.7	78.4	76.3	83.8			
Private	31.3	21.6	23.7	16.2			
Total	100.0	100.0	100.0	100.0			

<sup>\*</sup> Cargo output is a representation of work done on a trip, and is calculated as the weight of cargo carried times the distance the cargo moves

Source: Transport Canada

## 1995 ROADSIDE SURVEY RESULTS

In fall 1997, federal and provincial transportation officials released the National Roadside Survey, a new profile of truck traffic in Canada. The survey describes heavy-truck activity during one week in 1995 on Canada's National Highway System, as well as an additional 1.100 kilometres of other roads significant to truck traffic in individual provinces and territories. An analysis of one million truck movements and 36,000 driver interviews recorded at 148 survey sites across Canada formed the basis of the survey.

The survey gathered information on truck, carrier, driver, trip and cargo characteristics, as well as measures of trucking activity, including the number of trips, distance traveled, cargo tonnage transported, cargo tonnekilometres of transportation, gross vehicle weight moved, and vehicle tonne-kilometres of movement.

Tables 11-4 through 11-7 show samples of the information gathered about truck travel, carriers, drivers and vehicles. Complete results are available using the data analysis package that can be downloaded from the Internet at Transport Canada's Web site at http://www.tc.gc.ca or the Web site of the Canadian Council of Motor Transport Administrators at http://www.ccmta.ca.

On the basis of number of trips, intra-provincial trucking accounts for two thirds of inter-city trucking activity on Canada's major highways. Table 11-4 shows that share of activity is lower when viewed using other measures because intra-provincial trips on average are shorter and use

TABLE 11-6
DRIVER DISTRIBUTION OF TRUCK TRAFFIC

Characteristic:	Activity Measured in Terms of:					
Driver type	Number of trips	Distance traveled	Cargo tonnage	Cargo output*		
Company employee	78.9	72.0	76.0	69.3		
Owner-operator	17.4	24.6	20.9	28.1		
Independent	3.7	3.4	3.1	2.6		
Total	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	100.0		

<sup>\*</sup> Cargo output is a representation of work done on a trip, and is calculated as the weight of cargo carried times the distance the cargo moves

Source: Transport Canada

## TABLE 11-7 TRUCK TYPES ON CANADA'S ROADS

Characteristic:	Activity Measured in Terms of:					
Vehicle type	Number of trips	Distance traveled	Cargo tonnage	Cargo output*		
Semi-trailer	71.2	79.7	77.8	78.8		
Train	7.1	9.7	14.8	18.5		
Straight truck	20.0	9.4	5.7	1.9		
Other	1.8	1.2	1.7	0.8		
Total	100.0	100.0	100.0	100.0		

<sup>\*</sup> Cargo output is a representation of work done on a trip, and is calculated as the weight of cargo carried times the distance the cargo moves

Source: Transport Canada

relatively smaller trucks than trips in other sectors.

As indicated in Table 11-5, for-hire truck carriers handle most inter-city trucking. Private truck carriers' share of activity falls from one third of trips to one sixth of cargo output due to shorter average trips and smaller average trucks.

Table 11-6 indicates that while owner-operators (a truck owner working for a carrier under contract) have played an increasingly significant role in trucking in recent years, the majority of activity continues to be handled by company employees.

Table 11-7 shows that semi-trailer trucks handle by far the largest share of inter-city trucking. The different roles played by truck

trains and straight trucks are apparent from activity measures. Due to longer average trips and larger average capacity, the 7.1 per cent of trips by truck trains generate 18.5 per cent of the cargo output. Conversely, the shorter average trips and smaller average capacity of straight trucks indicate that their 20 per cent share of trips accounts for only 1.9 per cent of the cargo output.

#### INTERNATIONAL TRADE

Trade has been the key driver of Canada's economic growth over the past few years. Of the total \$389 billion in goods that Canada traded with its NAFTA partners, \$262 billion, or 67 per cent, was transported by truck.

TABLE 11-8 CANADA'S EXPORTS BY TF 1996	RUCK
Motor vehicles and parts	27%
Fabricated material	26%
Equipment miscellaneous	18%
Other	15%
Food	7%
Heavy equipment	7%
Total	100%
Source: Statistics Canada, Trade Division, special tabulations for Transpo	ort Canada

JCK
30%
21%
18%
15%
10%
5%
100%
J



### **Exports by Truck**

In 1996, Canada shipped \$133 billion worth of goods by truck to the US and Mexico, an increase of 24 per cent over 1994. These shipments consisted mainly of motor vehicles and parts, fabricated materials and equipment, and accounted for 59 per cent of total exports carried. Table 11-8 shows the distribution of Canada's exports by truck in 1996.

### Imports by Truck

Canada imported \$129 billion in goods by truck from the US and Mexico in 1996, accounting for 80 per cent of all goods imported. Imports from Mexico increased by 32 per cent between 1994 and 1996, while imports from the US increased by 13 per cent over the same period. Motor vehicles and parts, fabricated materials and equipment accounted for the majority of Canada's imports. Table 11-9 shows the distribution of Canada's imports by truck in 1996.

# TRUCKING INDUSTRY STRUCTURE

### NUMBER OF CARRIERS

Estimates in 1995 by the Canadian Trucking Research Institute (Fred Nix, *Trucking in Canada – A Profile*), indicate that there are approximately 9,400 for-hire carriers, 39,000 owner-operators, 450 large private carriers¹ and 2,400 courier companies in Canada. In addition, thousands more organizations engage in some form of trucking but are not captured in Statistics Canada surveys. These include

<sup>1</sup> Carriers with operating expenses of over one million dollars annually.

small for-hire carriers, private carriers, farmers, utility companies, municipalities that own trucks, etc. Figure 11-2 illustrates the number of for-hire carriers earning revenues of \$1 million or more per year.

Since 1990, the major carriers group (carriers that earn \$25 million or more per year) has represented, on average, less than four per cent of the total number of carriers in the Canadian trucking industry.

## ALLIANCES, MERGERS AND ACQUISITIONS

Trucking is a very competitive industry in a perpetual state of change, with new entries, mergers, acquisitions and bankruptcies happening all the time.

Canadian carriers are joining forces to expand service both within and between provinces and territories, as well as with other regions. Many companies have strengthened their positions by forming alliances, merging with or acquiring other carriers. Some examples in 1997 include:

- the acquisition of Thompson's Transfer Co. of Nova Scotia and Transport Super Rapide of Newfoundland by Cabano Kingsway Inc. to expand its Atlantic Canada and Quebecbased operations;
- the alliance of Ontario-based Challenger Motor Freight Inc. with Daily Motor Freight, which specializes in less-thantruckload services in Ontario and Quebec, to increase its services to the US;
- the acquisition of the Maritime bulk trucking operations of Corporation Provost Itée by Alberta-based Trimac;
- the acquisition of Brookville

# TABLE 11-10 TRUCKING BANKRUPTCIES ACROSS CANADA 1987 – 1997

Year	Atlantic	Quebec	Ontario	Prairies	B.C. and Terr	Total
1987	17	32	59	136	78	322
1988	22	40	77	163	92	394
1989	27	65	58	143	88	381
1990	57	142	147	213	97	656
1991	98	107	191	223	143	762
1992	70	119	188	171	88	636
1993	70	91	152	130	56	499
1994	37	67	. 88	125	33	350
1995	31	81	58	141	34	345
1996	74	90	107	197	59	527
1997	82	119	164	178	58	601
				1,70	00	001

Note: "Trucking industries" include general freight, used goods moving and storage, bulk liquids, dry bulk materials, forest products and other truck transport industries.

Source: Industry Canada, Office of the Superintendent of Bankruptcy; Transport Canada

Group, a large independent truckload carrier in Atlantic Canada by Contrans Corporation of Ontario;

- the agreement between Check Transportation by Logistics of British Columbia and Atomic Transportation System of Manitoba for less-than-truckload service between Eastern Canada and British Columbia; and
- the acquisition of Reimer Express Lines by Roadway Express Lines of Ohio to combine Roadway's extensive network and state-of-the-art information systems with Reimer's developed operations and Canadian marketing expertise.

Canadian carriers are also moving into the US market by forming partnerships with US-based carriers. These alliances not only expand the carriers' markets, they also reshape the way carriers do business by allowing them to offer more services over a much broader territory. In some cases, the companies integrate their information systems and share invoicing and inventory control. A recent example

involving a large Canadian carrier is the merger of Ontario's Frederick Group with Michigan's Bill Thompson Trucking to form FTI, which will provide long-haul truckload and local service, justin-time transportation and logistics services with a combined fleet of 800 tractors and 1,000 trailers.

#### BANKRUPTCIES

Bankruptcies dropped rapidly in 1993 and 1994, leveled out in 1995, then increased significantly in 1996 and again in 1997. Table 11-10 shows the number of trucking bankruptcies across Canada from 1987 to 1997.

## COMPETITION

## CONCENTRATION OF CARRIERS

The degree of concentration between the major carriers (those that earn \$25 million or more per year) and large carriers (those that earn between \$12 million and \$25 million) in the for-hire

TABLE 11-11
DISTRIBUTION OF TOTAL FOR-HIRE TRUCKING REVENUES
BY SIZE OF CARRIER
1990 – 1996

	Medium C (\$1-12		Large C: (\$12-2		Major Ca (\$25)	
	Revenue (millions of dollars)	Share (per cent of total)	Revenue (millions of dollars)	Share (per cent of total)	Revenue (millions of dollars)	Share (per cent of total)
1990	3,832.2	45.5	1,204.8	14.3	3,382.6	40.2
1991	4,028.8	47.8	1,107.6	13.1	3,298.2	39.1
1992	4,217.4	49.4	1,072.2	12.5	3,256.1	38.1
1993	4,542.9	49.3	1,268.0	13.7	3,411.1	37.0
1994	5,212.8	47.6	2,208.5	20.1	3,541.4	32.3
1995	5,460.6	45.0	3,090.0	25.5	3,576.9	29.5
1996	5,731.8	43.7	3,453.2	26.4	3,917.7	29.9

Note: Including motor for-hire carriers of freight earning annual revenues of \$1 million or more.

Source: Statistics Canada, Annual Motor Carriers of Freight Survey (AMCF) (1990–93); Annual Supplement (Q5) to the Quarterly Motor Carriers of Freight Survey -QMCF- (1994–96); Transport Canada

# TABLE 11-12 AVERAGE ANNUAL REVENUES BY SIZE OF CARRIER 1990 – 1996

	Medium Carriers	Large Carriers	Major Carriers
1990	\$ 3,129,070	\$ 17,460,435	\$ 61,501,636
1991	3,087,172	16,531,597	59,966,691
1992	3,144,945	16,753,031	59,201,036
1993	3,141,716	16,906,867	57,814,458
1994	3,335,147	18,715,788	66,819,736
1995	2,827,883	19,681,611	63,872,446
1996	2,902,177	22,278,710	58,473,134

e: Including for-hire carriers of motor freight earning annual revenues of \$1 million or more.

Source: Statistics Canada, Annual Motor Carriers of Freight Survey (AMCF) (1990–93); Annual Supplement (Q5) to the Quarterly Motor Carriers of Freight Survey -QMCF- (1994–96); Transport Canada

trucking industry is an indicator of the level of competition prevailing in the marketplace.

From 1990 to 1996, the revenues of major carriers as a percentage of total revenues decreased steadily, while the actual number of carriers in this category remained relatively stable at between 53 and 59 carriers. These numbers suggest a reduced level of concentration.

In 1995 and 1996, the number of major carriers began to increase as

large carriers acquired more smaller carriers.

In the large carrier group, the proportion of revenues to total industry revenues increased significantly from a low of 12.5 per cent in 1992 to over 26 per cent in 1996.

The proportion of revenues to total industry revenues for the medium group (carriers that earn between \$1 million and \$12 million) also increased steadily, moving from 45 per cent

in 1990 to almost 50 per cent in 1993. The proportion then declined to 44 per cent between 1994 and 1996.

Table 11-11 shows the percentage share of total for-hire revenues for each size of carrier from 1990 to 1996. Table 11-12 illustrates the average annual revenues for each size of carrier over the same period. The two tables indicate that competition within the trucking industry has not diminished from 1990 to 1996.

## OUTPUT AND PRICE CHANGES

Trucking revenues rebounded dramatically between 1992 and 1996, growing by more than 50 per cent after the sluggish 1989 – 1992 period during which revenues declined. This growth occurred as prices were falling by 3.8 per cent in nominal terms, or about one per cent per year. Preliminary results for the first half of 1997 indicate that trucking prices have stopped their downward trend. All in all, such a trend in prices is indicative of a mix of competitive forces and strong demand at play in the marketplace.

As previously noted, the major cause of growth in the trucking industry has been increased traffic to and from the US.

Since 1992, trucking performance in transborder markets has been remarkable with output growth reaching close to 18 per cent per year. This growth is tied closely with Canada's 14 per cent average annual increase in trade with the US over the same period. The growth of intra-provincial and inter-provincial trucking activities was also noticeable: 8.3 and 9.8 per cent per year, respectively. For 1997, output

growth was estimated to exceed ten per cent led by strong growth in transborder activity.

Prices for domestic and transborder trucking services have behaved differently. Between 1991 and 1996, for example, prices for intra-provincial and interprovincial trucking services all fell by approximately 0.9 per cent per year, while transborder prices increased by 0.3 per cent.

Prices do vary more, however, from one year to another and from one type of services to another. Prices for inter-provincial services, for instance, fell by 5.5 per cent in 1996, compared with a drop of 0.3 per cent for intra-provincial services. Transborder price changes remained in between the two, falling 3.4 per cent.

Table 11-13 shows annual price changes for intra-provincial, interprovincial and transborder trucking services for the years 1994 to 1997.

Over a longer period, from 1986 to 1994, for example, trucking prices increased by 5.5 per cent, while rail prices decreased by more than seven per cent, representing a 14 per cent deterioration in trucking's relative position. In 1997, the gap between the two modes persisted, although it was reduced to an estimated 12 per cent, and yet the trucking industry keeps increasing its market share. This implies that the truck/rail competition is more than simply a question of relative price.

TABLE 11-13 OUTPUT AND PRICE CHANGES IN TRUCKING 1994 – 1997						
Price Changes %	1994	1995	1996	1997*		
Intra-provincial	(0.4)	(0.0)	(0.0)			
Inter-provincial	(2.1)	(0.2)	(0.3)	0.8		
Transborder	(1.1)	(2.5)	(5.5)	2.5		
	4.0	0.2	(3.4)	2.7		
Total trucking	0.3	(0.8)	(3.1)	2.1		
Business economy	2.8	3.5	1.9	1.4 <sup>p</sup>		
Output Changes %						
Intra-provincial	14.1	5.6	9.6	(0.5)		
Inter-provincial	15.5	11.8	9.5	3.1		
Transborder	22.9	13.3	11.4	25.3		
Total trucking	17.5	10.3	10.2	10.3		
Business economy	5.2	2.4	2.8	3.8 <sup>p</sup>		
First two quarters of the year for trucking.     Preliminary						
Source: Transport Canada						

## FINANCIAL PERFORMANCE

## **H**IGHLIGHTS

The financial performance of the for-hire trucking industry improved in 1997. Revenues of large trucking firms surveyed by Statistics Canada increased by nine per cent in the first three quarters of 1997, compared with the revenues reported over the same period in 1996. Their operating margin also improved, from 3.6 to 4.4 per cent. Moreover, major Canadian trucking firms such as Vitran, Cabano Kingsbury, Mullen, and Trimac, have all reported substantial increases in profits in 1997. Yet Interlink Freight Systems had to declare bankruptcy.

## REVENUES/EXPENSES

The Canadian-based for-hire trucking firms (excluding household goods carriers) with annual operating revenues equal to or greater than one million had total operating revenues of \$12.6 billion in 1996, up eight per cent from a year earlier.

## TRUCKING INDUSTRY COSTS

Labour costs represented less than 28 per cent of the trucking industry's operating revenues, <sup>2</sup> excluding the costs related to hiring owner-operators under contract as shown in Table 11-14. If the owner-operator component were included, labour costs would account for 44 per cent of carriers' revenues.

<sup>2</sup> The relative importance of each factor input in the cost structure should be calculated in terms of total costs. But total costs include not only all operating costs, but also an allocation for the cost of capital. Measuring the cost of capital is a complex exercise and not all the information needed to measure it was available. Therefore total operating revenues were used in this report as a proxy for total costs under the assumption that net income is equivalent to the cost of capital.

<b>COST STRUCTURE AND</b>	<b>EFFICIENCY</b>	<b>INDICATORS</b>	OF TRUCKING

	1993	1994	1995	1996
Cost Structure (In % of Op. F	Rev.)			
Labour	30.5	29.0	30.0	27.9
Labour*	48.4	46.4	44.7	44.3
Fuel	8.4	9.6	9.5	9.8
Fuel *	12.3	13.3	12.6	13.3
Employees (in 000)*	109.8	119.0	120.5	125.0
Average Labour Cost per employee (\$000) *	39.4	41.4	43.2	44.6
Productivity Change (in %)				
Labour*	4.1	8.7	9.9	7.4
Fuel*	(2.1)	2.0	9.3	3.5
Total	2.5	2.4	3.4	4.7
Total -Economy	0.9	2.2	0.4	0.4
Unit Cost Change (in %)				
Labour trucking *	(0.3)	(3.3)	(5.0)	(3.9)
Total trucking	(1.3)	(1.1)	(0.9)	(1.7)

\* Adjusted to reflect the impact of owner-operators

Sources: Transport Canada based on Statistics Canada data

After declining between 1989 and 1992, employment in the trucking industry began to increase in 1993, rising by 20 per cent between 1992 and 1996. Labour costs averaged roughly \$44,600 per employee in 1996, 30 per cent above the national average for the whole economy.

Labour productivity during the same period also improved, advancing by 33 per cent in the trucking industry compared with 6.3 per cent in the general economy. Unit labour costs dropped 12 per cent over the same period.

Fuel costs in the for-hire trucking industry accounted for 9.8 per cent of the trucking industry's operating revenues in 1996. If fuel used by owner-operators is factored in, the share of fuel costs increases to about 13.3 per cent.

Fuel efficiency increased by four per cent between 1986 and

1989, but fell by 17 per cent between 1989 and 1993. Fuel efficiency improved by 13 per cent in 1995 and 1996.

#### PRODUCTIVITY

Productivity in the trucking industry increased by 14 per cent between 1992 and 1996, after a period of stagnation during the early 1990s. Input prices increased at a slower rate than prices in the overall economy. Per unit of output, trucking industry costs show a 4.8 per cent drop since 1992. This productivity gain has allowed the trucking industry to cope with the effect of lower prices without jeopardizing its financial position. In 1995 and 1996, the reduction of prices has been superior to the capacity of the industry to reduce its costs.

A major source of productivity gains has come from capital, mostly trucks. This means that the amount of capital used per dollar of output has been declining, which could be the result of a better utilization of assets, more efficient power units and changes to the fleet mix. While this decline in capital used per dollar of output may be indicative of an improved use of assets, it could also be indicative of the aging of the industry's capital stock.

#### **PROFITABILITY**

Based on large carriers' results over the first three quarters of 1997, the profitability of the Canadian for-hire trucking industry improved. After the first three quarters, the average operating margin of large carriers was 4.4 per cent, as opposed to 3.6 per cent over the same period in 1996. For the whole year 1996, the industry reported a 3.3 per cent average operating margin, a deterioration from the margin achieved in 1994 and 1995.

Table 11-15 highlights the financial results of for-hire trucking firms with annual revenues in excess of \$1 million over the period 1993 to 1996. Over the four year period, the trucking industry had significant revenue growth, 12 per cent per year on average. However, these revenue increases were, in large part, offset by cost increases. Consequently, the industry's operating margin fluctuated between 3.2 and 4.7 per cent (Figure 11-3).

Table 11-15 also compares, by region, the carriers' operating ratios, which are a key indicator of industry efficiency and profitability. The lower the operating ratio, the higher the operating profit margin.

In 1996, carriers based in British Columbia, the Territories and in the Atlantic Region had the highest average operating ratios, 98 and 97.5 per cent, respectively. Carriers in Ontario had operating

ratios at 97 per cent, higher than the 95.7 reported by Quebec carriers. In 1996, carriers from the Prairie region had an average operating ratio of 96.5 per cent.

### **INVESTMENTS**

At the end of 1996, the trucking industry's capital structure consisted of 56 per cent equity, 38 per cent debt and six per cent deferred taxes, although it is important to note that the capital structure varies significantly from one trucking firm to another.

Net fixed assets of carriers earning more than \$1 million annually grew from \$2.2 billion in 1993 to \$3.2 billion in 1996, due partly to the increased number of carriers and partly to capital expansion of the existing carriers.

## TABLE 11-15 FINANCIAL RESULTS OF FOR-HIRE TRUCKING FIRMS 1993 – 1996

	1993	1994	1995	1996		
	\$mill	lion				
Operating revenues	8,935	10,559	11,659	12,602		
Operating expenses	8,651	10,078	11,116	12,192		
Operating income	284	480	543	410		
Operating margin (%)	3.2	4.5	4.7	3.3		
Number of carriers	1,481	1,616	1,986	2,008		
Operating ratios (%) by region of domicile of carriers						
Canada	96.8	95.5	95.3	96.7		
Atlantic	96.4	96.5	95.5	98.0		
Quebec	96.5	95.0	95.1	95.7		
Ontario	97.4	95.1	95.4	97.0		
Prairies	96.4	95.8	94.9	96.5		
West	96.8	95.8	96.8	97.5		
Fixed assets	2,208	2,638	3,071	3,235		
Debt ratio (%)	36.2	35.2	38.8	38.0		
Sources: Statistics Canada, Cat. 53-222 and Transport Canada						

# FIGURE 11-3 OPERATING MARGINS OF THE FOR-HIRE TRUCKING INDUSTRY 1993 – 1997



\* Annual averages of carriers with revenues ≥ \$1 million,
 while quarterly data are based on large carriers with revenues ≥ \$25 million.

Source: Statistics Canada

## BUS

Changes in ownership of key bus firms took place in 1997. Charter operations remained the growing segment of the industry.

Scheduled intercity carriers, charter bus operators, school bus operators and urban transit operators make up the bus industry in Canada. Each segment of the industry shares the load for bus travel: carriers primarily providing scheduled services also provide charter services, while carriers primarily providing charter services also provide some scheduled and school bus services.

Scheduled intercity and charter bus operators provide the bulk of long-distance bus transport, both using similar equipment – highway coaches. School bus and urban transit operators carry out shortdistance bus transport. However, school bus operations are second in importance in the industry, with more revenue and carriers than those of scheduled intercity and charter buses combined.

Figure 12-1 shows the structure and revenues of the bus industry in Canada in 1996. Table 12-1 summarizes revenues by source of revenue for the same year.

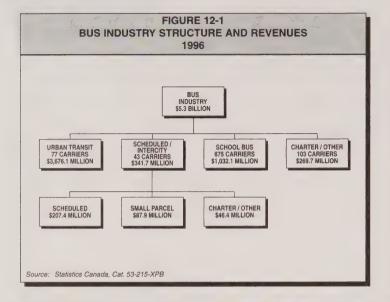
## Major Events in 1997

# MOTOR VEHICLE TRANSPORT ACT, 1987 REVIEW

Motor carriers (truck and bus) that operate regularly across

provincial boundaries (extraprovincial) fall under federal jurisdiction. Otherwise, bus operations came under provincial jurisdiction. However, the federal government does not actually regulate the operation of extraprovincial bus companies, having allowed each province to do so under the authority of the *Motor Vehicle Transport Act*, 1987 (MVTA).

While the MVTA regime varies from province to province, in most cases the province maintains some form of control over rates, schedules, routes, and entry to and exit from the market. Carrier licences are usually quite specific about the type of service the



SUMMARY OF REVENUES BY SOURCES OF REVENUE 1996					
	Intercity bus operators	Charter* bus operators	School bus operators	Urban** transit operators	Total
Number of establishments	43	103	675	77	898
Sources of revenues			\$ millions		
Scheduled services	207.4	19.3			226.7
Charters and tours	30.9	154.1	95.0	3.2	283.2
School/commercial contracts	7.8	15.5	805.7	3.7	832.7
Urban and suburban services		**	**	1,531.5	1,531.5
Other passenger services	7.0	67.6	107.8	5.8	188.2
Parcels, subsidies and other	88.6	13.2	23.7	2,132.0	2,257.4
Total	341.7	269.7	1,032.1	3,676.2	5,319.6

 Consists of Statistics Canada's category of "other passenger bus establishments excluding school bus operators"

\*\* Includes capital subsidies for urban transit operators.

Source: Statistics Canada, Cat. 53-215-XPB

carrier is allowed to provide, typically specifying routes for scheduled service or the territory in which the carrier is permitted to offer charter service. Essentially, the *MVTA* obliges a carrier to obtain an operating authority in each province in which it wants to operate.

The economic regulation of the intercity bus industry has been raised in the context of the federal–provincial internal trade negotiations, and no consensus was reached as to whether it constituted an interprovincial trade barrier. The discussions nevertheless provided the impetus for possible changes to the bus section of the *MVTA*.

Transport Canada's 1996 review of the MVTA included consultations with the provinces and national industry associations. In April 1997, the MVTA Review Discussion Paper was released, which analysed the results of the consultations and suggested areas in the Federal Act requiring change.

The discussion paper proposed deregulating charter bus services and streamlining the regulatory requirements for scheduled bus service through amendments to the Act, followed by full deregulation after a two-year interval.

Transport Canada invited reaction to the paper from all interested parties. Responses revealed, among other things, that there was still no consensus among the provinces or the carriers on whether to ultimately deregulate scheduled service.

In October 1997, the Deputy Minister of Transport announced that Transport Canada would issue a position paper which would respond to the comments received on the discussion paper and set out specific proposed changes to the Act as the basis for a last round of consultations.

### INDUSTRY EVENTS

There were several major developments in the industry in 1997, including the sale of charter services operators and of Greyhound Canada bus lines, Canada's leading intercity passenger bus service.

Coach USA Inc., a Texas-based charter operator, purchased two large Canadian charter carriers in 1997 – Autocar Connaisseur of Montreal, Quebec, and Trentway-Wagar Inc. of Peterborough, Ontario. Both acquisitions were approved under the *Investment Canada Act*.

In September 1997, Laidlaw Inc. purchased all outstanding shares of Greyhound Canada bus lines, a transaction with an aggregate value of approximately \$100 million. This move complements Laidlaw's local bus operations in Vancouver and Winnipeg, and its charter and tour operations in Victoria, British Columbia, and Banff, Alberta.

## CARRIER SERVICES

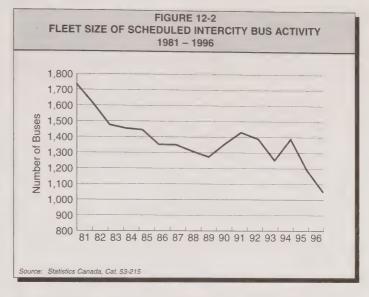
## SCHEDULED INTERCITY OPERATORS

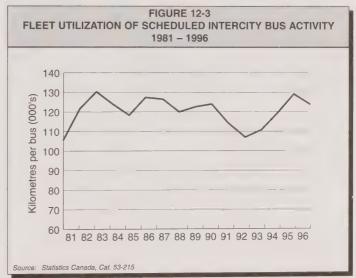
#### Services

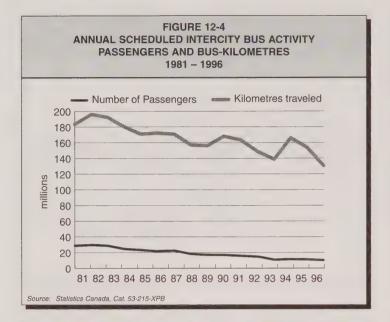
Most of the operating authorities that make up individual bus routes are exclusive to a single carrier. There are exceptions, but the majority of scheduled intercity passenger traffic occurs on bus routes operated under exclusive permits. In addition to passenger service, intercity operators also provide bus parcel-express services from which they generate a significant portion of their revenues.

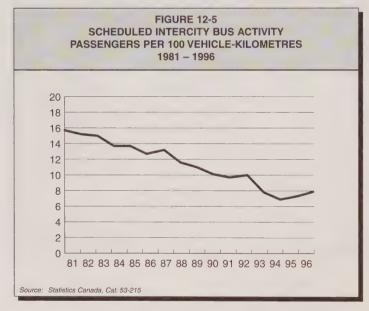
The number of buses operated by scheduled intercity carriers steadily declined between 1981 and 1989, then increased in 1990 and 1991. But since then, with the exception of 1994, the number of buses has declined every year (Figure 12-2).

Vehicle utilization, as measured by kilometres per unit of equipment operated, improved recently from a low of 107,000 bus-kilometres in 1992, to 129,100 bus-kilometres in 1995, then decreased to 124,000 bus-kilometres in 1996. Figure 12-3 shows how well the intercity fleet has been utilized from 1981 to 1996.









### Traffic

Long-term trends in the services provided by intercity carriers indicate an almost uninterrupted decline in passenger trips from a peak of 30 million passenger-trips in 1982 to 10.3 million in 1996. The year 1994 was the only exception. Figure 12-4 shows the changes in scheduled intercity passenger levels and the buskilometres they travelled from 1981 to 1996.

The relative trends in number of passengers and bus-kilometres travelled illustrates the difficulties faced by the industry in matching its services to the declining number of passengers. The industry is constrained by the minimum capacity offered by a single bus, the use of standard highway buses, preferred by operators for service quality and short-term cost considerations, and the spread of passenger demands over hours and days.

Figure 12-5 plots the number of passengers per bus-kilometre traveled from 1981 to 1996. The trend in passengers per 100 bus-kilometres indicates the average bus loads and shows an almost uninterrupted decline from close to 16 passengers per 100 bus-kilometres in 1981 to fewer than seven in 1994. Since the low of 6.9 passengers per 100 bus-kilometres in 1994, this measure has improved slightly to 7.9 in 1996.

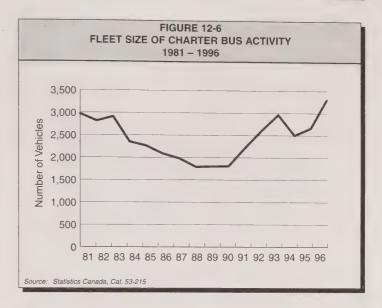
### **CHARTER OPERATORS**

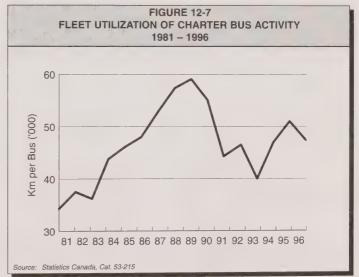
#### Services

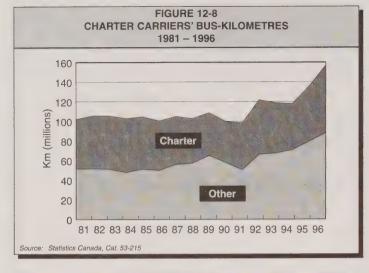
Charter services are generally characterized by a group trip where all passengers embark and disembark at the same point. Generally, charter operators are granted the right to operate trips out of a given location or city and allowed open-ended access to destinations. Operators have the flexibility to offer a broad spectrum of services ranging from a half-day school trip to a three-week excursion to Florida. They can also offer return or one-way trips. Local sightseeing tours are also considered a form of charter service.

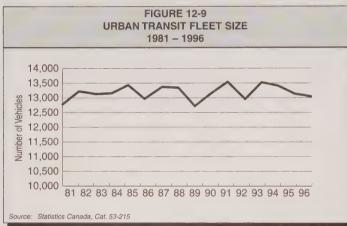
Figure 12-6 indicates a steady decline in fleet size from 1981 to 1988, a more stable period from 1988 to 1990, and a steady increase from 1990 to 1993, followed with some variations. The number of buses in charter operations was at its highest level ever in 1996.

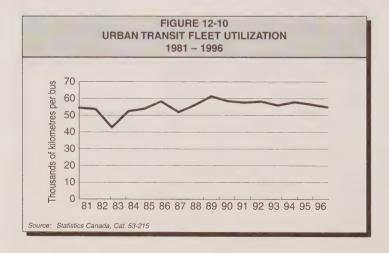
Charter bus use, as measured by the number of kilometres traveled per bus (km/bus), improved steadily between 1981 and 1989, reflecting a decrease in the total number of buses operated. As the fleet size increased in the early 1990s, vehicle use decreased accordingly. In 1994 and 1995, the adjustment downward to the fleet translated into an improvement of the fleet utilization. However, the significant increase in the number of buses reported in 1996 in charter operations translated into a relative drop in the average number of kilometres traveled per bus for that year. Figure 12-7 charts these fluctuations in charter bus fleet size.











#### Traffic

Figure 12-8 illustrates the development of the charter carriers' services since 1981. Charter business expansion is indicated by the increase in bus-kilometres. Since 1986, bus-kilometres increased by 76 per cent for charter services and by 36 per cent for other services provided by charter operators.

### URBAN TRANSIT

#### Services

Urban transit is, in terms of revenues, the largest component of Canada's bus industry. All major Canadian cities have some form of local bus service. Typically, this service is subsidized by both municipal and provincial governments. Some transit companies offer school and charter services, as well as elderly and disabled services. Many cities, including Vancouver, Calgary, Thunder Bay, Kitchener and Montreal, are adding low-floor buses to their fleets to improve service for the elderly and disabled. Figure 12-9 shows urban transit fleet size from 1981 to 1996.

The number of urban transit vehicles and their utilization rate remained fairly stable during the 1990s, with the total number of vehicles ranging from 13,000 to 13,500 and the average annual utilization rate from 55,000 to 58,000 kilometres per vehicle. Since 1993, the number of vehicles in urban transit services has been declining, 1996 being no exception. Over 1.200 minibuses, small buses and vans are included in this urban transit fleet. The composition of the fleet has varied little over the past five years. Figure 12-10 shows urban transit vehicle utilization from 1981 to 1996.

#### Traffic

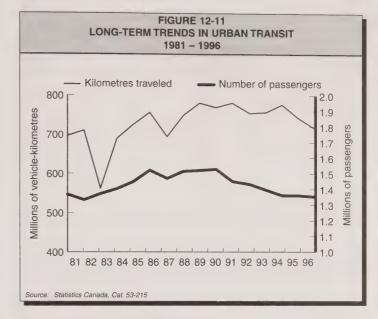
Figure 12-11 shows the long-term trends in urban transit. The number of passengers carried has declined continuously since the peak of 1.53 billion in 1990 to 1.35 billion in 1996. The average yearly distance traveled by all vehicles in urban transit operations, while almost unchanged between 1989 and 1994, declined in 1995 and 1996.

The number of passengers per 100 vehicle-kilometres gives an indication of the average bus load. Figure 12-12 reveals generally a declining pattern since 1983, with a few years with marginal increases over the preceding year (1987, 1990, 1992, 1995, 1996). The peak was observed in 1983 with 244 passengers per 100 vehicle-kilometres, while in 1996 this average load was at 188 passengers per 100 vehicle-kilometres.

## Financial Performance

Since 1993, the intercity bus industry has shown significant improvements in operating margins, attributable to cost reductions and price increases. The financial outlook of the industry is stable.

The revenue growth of the industry is coming primarily from tour bus services offered through charter bus operations. The charter segment of the bus industry has shown a relatively higher profitability than other segments since 1994.



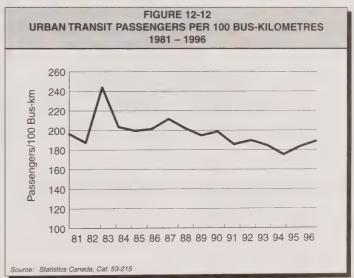
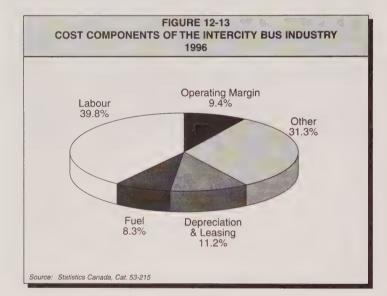


TABLE 12-2 PRICE AND OUTPUT CHANGES IN THE BUS INDUSTRY 1993 – 1996						
Dries shannes in 9/	1993	1994	1995	1996		
Price changes in % Regular Bus Services	(3.6)	0.5	2.4	4.9		
Charter Bus Services	(3.1)	(2.1)	(4.0)	(0.2)		
Total Bus*	(2.7)	(0.6)	(1.8)	0.6		
Output changes in %						
Regular Bus Services	(3.2)	(0.2)	(14.0)	(2.6)		
Charter Bus Services	2.7	(7.8)	18.8	5.2		
Total Bus*	(0.6)	(3.2)	7.5	(2.3)		
* Includes other passenger services and pa	* Includes other passenger services and parcels					
Source: Transport Canada based on Statist	ics Canada data					



## REVENUES AND EXPENDITURES

The combined operating revenues for the for-hire bus industry (i.e. the scheduled intercity, school bus and charter segment) and the urban transit bus transport industry totaled \$3.3 billion in 1996, excluding subsidies provided to the urban bus transit services. Including government subsidies, total revenues of the sector were in the order of \$5.3 billion.

Although urban transit passengers across Canada paid a total of \$1.6 billion to use bus services in 1996, this was not sufficient to cover the costs of urban transit operations. The average cost-recovery ratio was about 50 per cent. Therefore, this transport activity received government subsidies. In addition to operating subsidies, governments also contributed to capital expenditures on urban transit systems. Total operating and capital subsidies to this sector amounted to \$2.1 billion in 1996.

Total revenues of school bus operators amounted to \$1 billion in 1996. While school busing is a large segment of the bus industry in terms of revenues, its business scope is limited to special local services. Consequently, school bus operations are excluded from the financial performance analysis.

The intercity bus industry (i.e. scheduled and charter services) provides passenger services which have to be competitive with other modes of transportation. Total annual revenues from scheduled and charter bus services reached \$611 million in 1996, of which scheduled bus operators had a 56 per cent share of the market, while charter bus operations accounted for the remaining

44 per cent. It is important to note, however, that the split of revenues between these two types of services is based on each carrier's main operations. Thus, a carrier classified as a scheduled bus operator may also have generated a smaller percentage of revenues from charter services and vice versa.

## OUTPUT AND PRICE CHANGES

The activities of the scheduled and charter intercity bus industry can also be divided as follows: 85 per cent passenger services, 12 per cent parcel services and three per cent other services. Scheduled passenger services used to generate up to 60 per cent of passenger revenues. In 1996, these were contributing less than 45 per cent of passenger revenues. When output measures are used, the differences are more striking.

Between 1992 and 1996, the output of charter services grew by 18 per cent while it declined by 19 per cent for scheduled services. The major factor has been a nine per cent decline in the price of charter services whereas the prices of intercity services rose by four per cent. Overall, the aggregate prices of bus services have nominally declined by four per cent since 1992, a drop of 13 per cent in real terms. In spite of lower prices, output increased by only 1.1 per cent over the 1992 - 1996 period (Table 12-2).

#### INDUSTRY COSTS

Total labour costs accounted for 42.5 per cent of revenues in 1993. Over the past three years, however,

TABLE 12-3 FINANCIAL HIGHLIGHTS OF THE CANADIAN BUS INDUSTRY INTER-CITY SCHEDULED AND CHARTER SERVICES 1993 – 1996

	1993	1994	1995	1996
		\$m	illion	
Operating revenues	598	579	608	611
Scheduled	368	381	365	341
Charter & other	230	198	243	270
Operating expenses	565	531	545	554
Scheduled	345.	350	333	306
Charter & other	220	181	212	248
Operating income	33	48	63	57
Operating margin	5.5%	8.4%	10.4%	9.4%
Net fixed assets	355	336	375	362
Debt ratio	42.4%	47.8%	47.7%	48.3%
Sources: Statistics Canada data files				

there has been a steady decline in the labour cost ratio. In 1996, total labour costs dropped to 39.8 per cent of total operating revenues, with drivers' wages and salaries alone accounting for 22 per cent of that total. The average cost of labour has remained well below that of other transportation industries, lower than even the average labour costs within the whole economy.

Within the bus industry, labour productivity was falling in the late 1980s and early 1990s. However, between 1992 and 1996, it increased by 13 per cent. During that same period, unit labour costs fell by almost ten per cent.

In 1996, fuel costs represented only 8.3 per cent of the bus industry operating revenues. Fuel costs have been stable over the past few years at eight per cent of total operating revenues. Since 1992, fuel efficiency has increased in the industry by 24 per cent, the

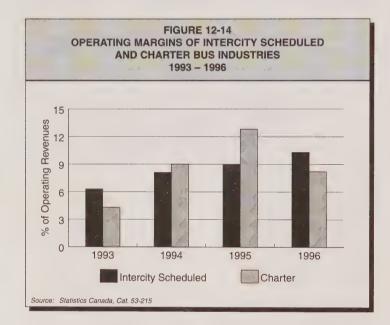
best performance of any transport industry. Other operating costs, which include marketing, materials other than fuel, insurance and miscellaneous expenses, amounted to 46 per cent of operating revenues. The largest expenses are repair and maintenance (ten per cent of operating revenues). In 1996, the operating margin was 9.4 per cent (Figure 12-13).

#### **PRODUCTIVITY**

Total factor productivity of the intercity bus industry, after a strong growth in 1993 and 1994, slowed down to 0.7 per cent in 1996. In spite of a small blip in 1996, industry unit costs have declined by nine per cent overall since 1992. Since the unit costs of the bus industry have fallen more rapidly than its prices, the financial viability of the industry has improved over the last several years (Table 12-4).

<sup>1</sup> The relative importance of each factor input in the cost structure should be calculated in terms of total costs. But total costs include not only all operating costs, but also an allocation for the cost of capital. Measuring the cost of capital is a complex exercise and not all the information needed to measure it was available. Therefore total operating revenues were used in this report as a proxy for total costs under the assumption that net income is equivalent to the cost of capital.

TABLE 12-4 COST STRUCTURE AND EFFICIENCY INDICATORS OF THE BUS INDUSTRY 1993 – 1996				
	1993	1994	1995	1996
Cost Structure (In % of Op. Rev.)				
Labour	42.5	41.2	41.7	39.8
Fuel	8.4	8.0	8.5	8.3
Employees (in 000)	8.8	7.9	8.3	8.0
Average Labour Cost per employee (\$000)	29.0	30.3	30.4	30.5
Productivity Change (in %)				
Labour	0.9	9.1	(1.6)	4.3
Fuel	6.5	6.1	2.5	1.7
Unit Cost Change (in %)				
Labour	(3.7)	(4.1)	1.8	(3.8)
Total	(4.2)	(4.6)	(0.9)	(0.4)
Source: Transport Canada, based on VIA data files				



#### **PROFITABILITY**

Table 12-3 presents the financial highlights of the Canadian intercity bus industry for the period from 1993 to 1996.

Following a year of growth in 1995, the bus industry's revenues leveled off in 1996. Although total revenues of charter bus services increased by 11 per cent, this increase was offset by weaknesses in scheduled bus activities. Nevertheless, in 1996 scheduled intercity bus operations showed an improved profitability, while charter bus services faced a decline in its profit margin. Overall, the industry's operating profit margin came down to 9.4 per cent in 1996, still a significant improvement over the 5.5 per cent of 1993.

The scheduled bus industry was able to improve its profitability by increasing its prices and reducing its costs. On the other hand, the charter bus segment of the industry faced a deterioration in its profitability in 1996, despite higher sale volumes and revenues stimulated by lower average prices.

### **INVESTMENTS**

Total net fixed assets, including equipment and other property, were valued at \$362 million in 1996. Provision for depreciation was about \$45 million in 1996, but equipment leasing by carriers increased slightly.

On average, the capital structure of the bus industry consisted of 48 per cent debt and 52 per cent equity.

# TRANSPORTATION STATISTICS

Regulations were introduced for transport data collection and developmental work on a "Canadian Vehicle Survey" was initiated.

Reviewing the state of transportation in Canada requires information, statistics and analysis. While this report makes extensive use of various sources of data, the limited availability of statistics has narrowed the scope and extent of its coverage. Nevertheless, the usefulness of transport statistics is evolving rapidly.

Owners and/or operators of transportation facilities require statistics to monitor trends and performance, forecast changes, judge the adequacy of their facilities and services, evaluate their competitive position, and develop alternatives to improve efficiency and economic performance. Designers and

overseers of transportation policy need to monitor developments in activities and carrier markets. Regulators need to measure the safety and environmental damage control aspects of system performance, design cost-effective interventions, and evaluate their efforts after implementation.

Governments are becoming increasingly concerned with transportation safety and transportation's environmental impacts. As such, they will continue to be involved in prescribing the performance characteristics of transportation infrastructure and vehicles, setting operating and maintenance practices for carriers, and

determining shippers' obligations in handling hazardous materials. They will also continue to enforce regulations by inspecting equipment and facilities, testing equipment and operators, auditing enterprises, and controlling road traffic behaviour.

In addition, the travelling and tax-paying public, employees of transportation-related industries, and transportation planners and researchers all have legitimate interests in obtaining comprehensive national statistics on transportation in Canada. Prior to 1997, there was no routine compilation of transportation information in a single source, but that gap is being filled by this

report, as required by the *Canada* Transportation Act.

The legislation directs that the annual report provide extensive quantitative information, which the department interprets broadly to allow non-specialists to understand the transportation system and its performance. The legislation also directs that the previous calendar year be the focus of the report, posing an additional challenge to obtain statistics within a very short time frame.

The report does not, however, assemble a compendium of statistics, but rather provides interpretations of statistics that reveal characteristics and trends. Brief summary tables and graphics present much of the quantitative information, while a data compendium available on Transport Canada's Web site contains the underlying statistics.

## IMPROVED NATIONAL STATISTICS IN 1997

Transport Canada's past, present and future changes to the ownership and operations of transportation in Canada have had important consequences for national statistics. A number of organizations in each mode of transportation – air, marine, road and rail – are no longer covered by routine federal statistics-gathering. For example, organizations that were previously government operations, such as many airports and ports and the air navigation system, used to provide their operating and financial statistics within Transport Canada but are no longer required to do so in the reorganized department. In addition, they are not the subject of Statistics Canada industry surveys.

The Canada Transportation Act of 1996 (section 50¹) provided a solution to this problem. It gave the Minister of Transport the authority to require data on the operations of any transportation undertaking under federal jurisdiction. Once regulations were introduced, the provision further clarified the Minister's authority to obtain data for policy development, operations or program planning, and for the preparation of this annual report.

During 1997, regulations were introduced concerning rail undertakings, marine service undertakings, federal airports and Local Airport Authorities, Nav Canada, and the St. Lawrence Seaway. Subsequent regulations

will apply to ports, including those under federal operation and the proposed Canadian Ports Authorities, and to the non-carrier undertakings in grain transportation – elevators and terminals.

## MAJOR REMAINING GAPS

While these regulations will broaden the information available on commercial transportation enterprises, there continues to be insufficient national statistics on private transportation activities, which account for almost all national passenger travel (passenger-kilometres) and a significant portion of freight traffic (tonne-kilometres). These gaps limit the government's ability to plan for infrastructure and publiccarrier service requirements, understand private-transport accident risks and environmental damage, and compare accident risk and environmental damage intermodally.2

To be even more effective in the future, the government requires data that includes:

 a. descriptions of the road vehicle fleet, distinguishing vehicles by type (i.e., cars, light trucks, and heavy trucks of various sizes);

#### 1 Section 50 reads:

- "(1) The Minister may, with the approval of the Governor in Council, make regulations requiring carriers or transportation or grain handling undertakings to which the legislative authority of Parliament extends to provide information to the Minister, when and in the form and manner that the regulations may specify, for the purposes of
- (a) national transportation policy development;
- (b) annual reporting under section 52;
- (c) operational planning;
- (d) any safety or subsidy program;
- (e) any infrastructure requirement; or
- (f) the administration of this Act.
- (2) Information required to be provided under subsection (1) may include the following:
- (a) financial data;
- (b) traffic and operating statistics; and
- (c) fitness and ownership information"
- 2 For the last comprehensive Transport Canada assessment, see Lawson, J: Data Needs Review, Economic Analysis, Transport Canada, July 1993 [available in html on www.tc.gc.ca/tfacts/Report].

- aggregate descriptions of vehicle-kilometres by road vehicles, according to:
  - · type of vehicle,
  - demographics of drivers and other occupants,
  - · time (hour, day, month) and
  - · age of vehicle;
- c. aggregate descriptions of tonne-kilometres, according to:
  - total carried by private freight vehicles, and
  - total arrived by private freight vehicles carrying hazardous commodities; and
- d. descriptions of traffic on highways by route or road section according to:
  - annual average daily traffic volume, and
  - · proportion of heavy trucks.

### REMEDIAL ACTION

During 1997, Transport Canada, in partnership with Statistics Canada, began development of the "Canadian Vehicle Survey," a new national survey to gather information on the road vehicle fleet, vehicle-kilometres and tonne-kilometres.

In collaboration with the Canadian Council of Motor Transport Administrators and the vehicle licencing authorities in the provinces and territories, Statistics Canada draws samples of vehicles from vehicle registration files and asks owners to provide information on activities, including one-to-seven-day logs of all trips. These include the odometer readings for each trip, the start and finish times, driver demographics, the number of occupants for passenger vehicles, and commodities carried for freight vehicles.

Throughout 1997, Statistics
Canada and the collaborating
agencies formed working groups
on a methodology that would
allow access to registration files,
while still safeguarding
confidentiality. In addition, the
groups designed questionnaires
and tested them on focus groups.
By the end of the year, they had
started a pilot program, sampling
500 vehicles in Quebec and British
Columbia.

If the methods prove sufficiently reliable and cost-effective, the groups plan to begin a national pilot program to test 1,000 vehicles in the first half of 1998, with the intention of full-scale implementation later in the year.

If the national survey proceeds as planned, the next priority for national transport statistics will be to describe the route traffic on Canada's highways. And, if the application of intelligent transportation system technology fulfils its promise of recognizing and recording vehicles cost-effectively, Transport Canada can look forward not just to traffic volume descriptions but also to a wealth of data that describes trips from origin to destination.







ISBN-0-662-26773-7



Cat. No. T1-10/1997E ISBN 0-662-26773-7

Également disponible en français sous le titre «Les transports au Canada 1997



## TRANSPORTATION IN CANADA 1998 ANNUAL REPORT







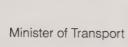
## TRANSPORTATION IN CANADA 1998 ANNUAL REPORT



© Minister of Public Works and Government Services, Canada, 1999

Cat. No. T1-10/1998E ISBN 0-662-27586-1

Également disponible en français sous le titre «Les transports au Canada 1998»





Ministre des Transports

Ottawa, Canada K1A 0N5

28/4/99

His Excellency the Right Honourable Roméo Leblanc, P.C., C.C., C.M.M., C.D. Governor General of Canada Rideau Hall
1 Sussex Drive
Ottawa, Ontario
K1A 0A1

#### Excellency:

I am pleased to submit to your attention the 1998 annual report on the state of transportation in Canada. This report responds to the requirements set out in section 52 of the Canada Transportation Act.

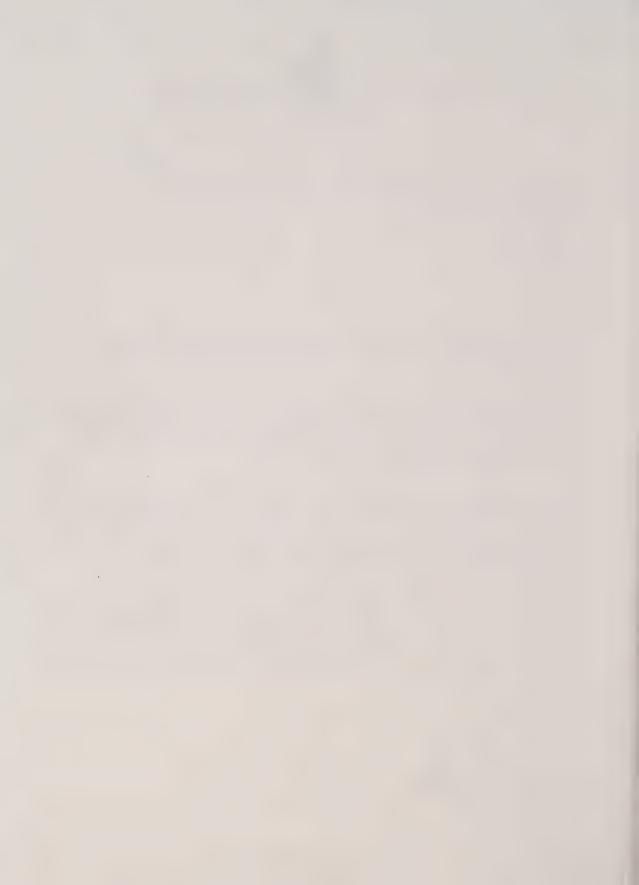
The World Economic Forum, an organization which ranks countries in terms of their global competitiveness, has identified Canada's transportation system as the best in the world. While we can take pride in this international recognition, we have to ensure that our transportation system continues to support Canada's global competitiveness, economic productivity, healthy social structures and a sustainable quality of life.

The 1998 annual report provides a unique collection of data and observations on the use of the Canadian transportation system, its performance, its safety, its impact on energy conservation and the environment, and its contribution to the economy and well-being of Canadians. In 1998, transportation continued to support economic growth driven largely by Canada's trade activity. The financial results of transport carriers experienced a slight erosion in 1998, compared to 1997, while improvements in transportation safety and productivity of carriers were continued.

The federal government policy framework continues to emphasize market forces, while ensuring the safety and security of the transportation system through regulation and monitoring of compliance. As Canada prepares to enter the new millennium, it becomes more important for all levels of government to work together with communities, urban and rural, and with all stakeholders, shippers, carriers and consumers, to preserve a transportation system that meets the highest standards in the world.

Yours sincerely,

Hon. David M. Collenette, P.C., M.P.



## **Table of Contents**

Chapt	er Page Nui	mbei
REPOR	RT HIGHLIGHTS	
1.	Introduction	
PART A	A: THE ECONOMY, PRODUCTIVITY PERFORMANCE AND GOVERNMENT SPENDING	3
2.	Transportation - The Canadian Economy and Sector Productivity The Importance of Transportation A Review of 1998 Key Socio-Demographic Trends Productivity Performance of the Economy and Transportation Transportation and International Initiatives in 1998	10 13 14
3.	Government Spending on Transportation	21
PART 1	B: TRANSPORTATION AND SUSTAINABILITY	35
	Transportation and Safety Transportation Occurrences 1998 Contributions to Transportation Safety	37 37 50
5.	Transportation and Environment Key Developments in 1998 Transportation Programs Aimed at Improving Environmental Quality Looking Ahead	59 59 64
6.	Transportation and Energy Developments in 1998 Energy Demand Factors Influencing Transportation Energy Use Canada's Fuel Efficiency Programs	65 68 69 71 73
7.	Transportation and Regional Economies The Value-Added of Commercial Transportation Provincial Transportation Investment	75 78 83
8.	Transportation and Employment  Workforce Average Salaries Labour Stoppages in Transportation	87 88 109 114
9.	Transportation and Trade  Domestic Trade  International Trade	117 117 122
10.	Transportation and Tourism  Tourism Expenditures  The Travel Account and International Passenger Fares	135 135 138
11.	Transportation and Information Technology The Impact of ICT on the Supply of Transportation ICT's Impact on Transportation Demand Summary	147 149 159 166

## Table of Contents (Cont'd)

Chapter Page		
PART	C: Transportation, Infrastructure and Services	. 167
12.	Transportation Infrastructure Rail Transportation Infrastructure Highway Transportation Infrastructure Marine Transportation Infrastructure Air Transportation Infrastructure Freight Forwarders Warehouses	. 171 . 175 . 181 . 194 . 204
13.	Industry Structure Rail Transportation Industry Trucking Industry Bus Transportation Industry Marine Transportation Industry Air Transportation Industry	. 209 . 211 . 218 . 221
14.	Freight Transportation Rail Transportation Trucking Transportation Maritime Transportation Air Transportation	<ul><li>. 239</li><li>. 247</li><li>. 254</li></ul>
15.	Passenger Transportation Rail Transportation Bus Transportation Automobile Transportation Maritime Transportation Air Transportation	. 267 . 268 . 273 . 275
16.	Price, Productivity and Financial Performance in the Transportation Sector Rail Industry Trucking Industry Bus Industry Marine Transportation Industry Air Transport Industry	. 290 . 297 . 301 . 307

### LIST OF TABLES

Table	Title	D
2. Trai	nsportation - The Canadian Economy and Sector Productivity	Page
2-1	Uross Domestic Product Prices and Income	
2-2	Investment in Transportation	(
2-3	Total Transport Demand	. 7
2-4	Spending on Transportation Per Household	8
2-5	Transportation Labour Indicators	14
3. Gove	ernment Spending on Transportation	
3-1	Governments' Net Expenditures on Transportation	
3-2	Revenues Credited to Federal Departments' Budget  Governments' Revenues From Transportation Not Credited To Transportation	22
3-3	Governments' Revenues From Transportation Not Credited To Transportation Budgets	23
3-4	Federal Government Gross Expenditures On Transportation  Transport Canada Gross Spending On Transportation  Transport Canada Gross Spending On Transportation	24
3-5	Transport Canada Gross Spending On Transportation  Transport Canada's Level of Cost Recovery	. 25
3-6	Transport Canada's Level of Cost Recovery  Direct Federal Subsidies, Grants And Contributions By Mode	. 25
3-7	Direct Federal Subsidies, Grants And Contributions By Mode.  Federal Subsidies, Grants And Contributions By Mode.	. 26
3-8	Federal Subsidies, Grants And Contributions, Rail Federal Subsidies, Grants And Contributions, Highways and Bridges	. 27 . 28
3-9		
3-10 3-11	Federal Subsidies, Grants And Contributions, Trucking Federal Subsidies, Grants And Contributions, Marine	. 28
3-11		
3-12		
3-14	Federal Expenditures on Transport Facilities and Services	. 30
3-15		
3-16		
3-17		
	2	34
	sportation and Safety	
4-1	Transportation Occurrences by Mode, 1998 vs. Five-Year Average	3.8
4-2		
4-3		
4-4 4-5	Crossing Accidents by Flovinge	4.0
4-5 4-6	Trespusser rectidents by I lovinge	4.0
4-7	Total Road Casualty Comisions and Fersons Innifed of Killed	4.0
4-8	Trodd I didnites by Categories of Road Users	4.0
1-9	Commercial Vehicles And Other Vehicles Involved In Fatal Traffic Collisions By Vehicle Type	43
4-10	Vehicles Involved In Fatal Collisions By Vehicle Type	44
4-11	Marine Occurrences  Accidents Involving Canadian-Registered Aircraft  Accidents Involving Canadian-Registered Aircraft	45
1-12	Accidents Involving Canadian Registered Aircraft by Region.	46
1-13	Fatalities Involving Canadian-Registered Aircraft by Region	47
1-14	Toportion of Fatal Aviation Accidents, Canada – US	40
F-15	Reportable Accidents involving Dangerous Goods by Mode of Transport	50
l-16	Deaths and injuries Caused by Dangerous Goods at Reportable Accidents	50
<b>⊢</b> 17	Total Deaths and Injuries at Reportable Dangerous Goods Accidents	51
. Trans	portation and Energy	
-1	Growth Between 1000 and 1006 in Engage and Thomas A	
-2	Growth Between 1990 and 1996 in Energy use and Transportation Activities	68
		70
. Trans	portation and Regional Economies	
-1	Annual Growth in Provincial Economies, Real Gross Domestic Product	77
-2	Annual Growth of Provincial Imports and Exports	79
-3	Annual Growth of Commercial Transportation	80
-4	Annual Growth in Total Transportation Demand	82
. Transi	portation and Employment	
-1	Transportation Employment By Category	89
-2	Employment by Rail Transport Services	90
-3	Total Employment by Rail Transportation Services	90
-4	Employment by For-Hire Trucking Firms	91
-5	Employment by Medium and Large For-Hire Trucking Firms by Region	91
-6	Employment By Small For-Hire Trucking Firms	92

1 avie	Tine	ruge		
	nsportation and Employment (continued)	0.0		
8-7	Employment By Private Carriers			
8-8	Number of Full-Time Employees: Owner Operators	93		
8-9 8-10	Employment by Scheduled Intercity Bus Operators			
8-11	Employment by School Bus Operators			
8-12	Regional Distribution of Employment by School Bus Operators			
8-13	Category of Employment for Charter and Other Passenger Bus Companies			
8-14	Charter and Other Passenger Bus Companies Employment by Region	95		
8-15	Employment by Urban Transit Companies			
8-16	Regional Breakdown of Employment by Urban Transit Companies			
8-17	Number of Taxi and Limousine Drivers Employed in each Province			
8-18	Distribution of Employment by levels I-IV Air Carriers	98		
8-19	Total Full-Time Employment, Air Carriers	98		
8-20	Employment by Canadian-Based Marine Carriers	99		
8-21	Employment by Marine Sector			
8-22 8-23	Regional Distribution of Employment by Canadian Ferry Operators  Employment in, Rail Infrastructure Services			
8-24	Employment, by Region, Highways and Heavy Construction			
8-25	Employment, Canadian Airport Authorities			
8-26	Employment by Proposed Canadian Port Authorities.			
8-27	Employment by Canada Ports Corporation			
8-28	Employment by Category in the St. Lawrence Seaway Authority	103		
8-29	Planned Full-time Equivalents in Federal Departments and Agencies			
8-30	Employment by Provincial and Territorial Governments	105		
8-31	Employment, Pilotage Authorities	106		
8-32	Employment, Maritime Employers Association	106		
8-33	Employment, British Columbia Maritime Employers Association			
8-34	Census Employment Data – Longshore Workers			
8-35	Employment of Travel Agencies and Tour Operators by Province			
8-36 8-37	Distribution of Employment in "Other" Associated Services			
8-38	Average Weekly Earnings in the Transportation Sector by Mode			
8-39	Average Weekly Earnings in Transportation by Region			
8-40	Average Annual Compensation in the Rail Industry			
8-41	Average Weekly Earnings in the Trucking Industry in Eastern Canada			
8-42	Average Weekly Earnings in the Trucking Industry in Western Canada	112		
8-43	Average Annual Salary in the Bus Industry			
8-44	Annual Labour Costs per Employee of Canadian-Based Marine Carriers			
8-45	Labour Cost of Canadian Air Carriers			
8-46	Number of Labour Stoppages by Mode of Transportation			
8-47	Number of Workers Involved in Labour Stoppages by Mode of Transportation			
8-48	Number of Person-Days Lost in Labour Stoppages by Mode of Transportation	110		
<b>9. Tran</b> 9-1	nsportation and Trade Domestic Transportation Flows	110		
9-2	Domestic Transportation Flows by Sector and Mode			
9-3	Inter-Provincial Trade, 1996, Main East-West Routes			
9-4	Canada-US Transborder Trade, 1997, Main North-South Trade Flows			
9-5	Canada's Trade With Non-US Countries, Main Trade Flows - Exports			
9-6	Canada's Trade With Non-US Countries, Main Trade Flows - Imports	133		
9-7	Domestic Exports by Country Groupings	134		
9-8	Imports to Canada by Country Groupings	134		
	ansportation and Tourism			
10-1	Supply and Demand of Tourist Goods in Canada			
10-2	Domestic and International Travel in Canada			
10-3	1997 Domestic Travel Activity According to Transportation Mode			
10-4	1998 Canada/US Travel by Transportation Mode	143		
	ansportation and Information Technology			
11-1	ITS Classification Used by US D.O.T.			
11-2	Highway 407 ETR, Prices Per Kilometre, Per Rate Period and Vehicle Class	152		

1 abie		Page		
11. Trai	nsportation and Information Technology (continued)			
11-4	Annual Growth in Commercial Transportation Industries	160		
11-5	TIUCK DITYCIS EMBROYED BY MOUSETY			
11-6	-0 Income and Price Elasticities for Transport and Communications United Kingdom and Australia			
11-7 11-8	Large Scale Telecommuting Forecasts	1/1		
11-0	Sector Distribution of Net Financial Benefits From Increased Telecommuting in Greater Vancouver	165		
12. Trai	nsportation Infrastructure			
12-1	Components of Canada's Transportation Infrastructure	170		
12-2	Ownership and Operation of Canada's Rail Infrastructure	172		
12-3	CN and CP Rail Rationalization by Province	170		
12-4	CN and CP Three-year Rationalization Plans by Province	175		
12-5	Canada's Highway / Road System	177		
12-6	Cost Estimates to Correct National Highway System Deficiencies	179		
12-7 12-8	Current Transport Canada Highway Contribution Programs	180		
12-9	Ports No Longer Under the Administration of Transport Canada	181		
12-10	Status of Transport Canada's Ports by Province and Year Financial Profile, Ports Canada Ports	182		
12-11	Financial Results of Major and Divisional Ports	183		
12-12	Harbour Commissions Financial Results	101		
12-13	Financial Results for Transport Canada Ports.	185		
12-14	Total Tonnage Handled in Canada's Port System	186		
12-15	St. Lawrence Seaway Commodity Shares	187		
12-16	St. Lawrence Seaway's Financial Performance	189		
12-17	Pilotage Authority Financial Results, 1998	191		
12-18	Pilotage Authority Financial Results, 1994 – 1998	191		
12-19	Total Pilotage Assignments and Assignments per Pilot	192		
12-20	Coast Guard 1998 Vessel, Aircraft and Facility Assets	192		
12-21	Canadian Coast Guard, Revenues and Expenditures	193		
12-22	Canadian Coast Guard, Revenues and Budgeted Expenditures			
12-23	Canada's Air Navigation Workload Indicators			
12-24	Financial Summary for NAV Canada	196		
12-25 12-26	Annual Status of Federal Airport Divestitures as of December 31, 1998			
12-20	Airport Improvement Fees at Canadian Airports at December 31, 1998	201		
12-27	Projects Approved under the Airports Capital Assistance Program by Site and Province			
12-29	Airports Capital Assistance Program, Expenditures by Province			
12-30	Canada Sufferance Warehouses by Mode			
	·			
	stry Structure	210		
13-1	Major Shortline Operations in Canada	210		
13-2	Non-Via Rail Remote Passenger Services	211		
13-3 13-4	For-Hire Trucking Firms Revenues by Market Segment	214		
13-4	Major For-Hire Carriers, by Sector	215		
13-6	Distribution of Total For-Hire Trucking Revenues by Size of Carrier.	216		
13-7	Number of Owner-Operators Hired by Carrier Type	217		
13-8	Summary of Revenues by Sources of Revenue	218		
13-9	Regulatory Status of Extra-Provincial Bus Operators by Province	219		
13-10	Largest Scheduled Intercity Carriers by Number of Coaches	219		
13-11	Scheduled Intercity Carriers by Province	220		
13-12	Charter Bus Companies by Province.	220		
13-13	Largest Charter Rus Companies by Number of Coaches	221		
13-14	East Coast Canadian-Flag Cargo Fleet, 1,000 GRT and Over	223		
13-15	West Coast Canadian-Flag Cargo Fleet, 1,000 GRT and Over	224		
13-16	Shipping Conferences Serving Canada In 1998	220		
13-17	Global Airline Alliances	232		
13-18	Aircraft of Selected Canadian Carriers in Passenger Services.	233		
13-19	Air Canada and Canadian Airlines, Regional-Code Share Partners	. 233		
13-20	Canadian Carriers Operating for US Based Courier Entities	234		
13-21	a CD 11: of December 1008	234		
13-22	Proportion of Personnel Licences and Permits by Province, December 1998	235		
13-23	reportion of resonance Electrices and retining of resonance.			

Table	Title	Page		
14. Freig	ght Transportation			
14-1	Rail Exports and Rail Growth to the US, by Province	240		
14-2	Rail Imports, Import Growth by Province			
14-3				
14-4				
14-5				
14-6				
14-7	For-Hire Truck International Traffic by Sector and Province			
14-8	Sales of Class 8 by Province	251		
14-9	Commercial Trucks Registered in Canada in 1997			
14-10	Canadian Flag Share of Canadian Waterborne Trade			
14-11	Marine Domestic Flows by Region	254		
14-12	Value of Canada's International Trade, Marine Share			
14-13	Value of Canadian Exports by Water, Main Destinations	257		
14-14	Value of Canadian Imports by Water, Main Countries of Origin			
14-15	Conference/Non-Conference Shares of Canadian Liner Trade			
14-16	Liner Traffic by Region			
14-17	Canada's Maritime Trade with the US			
14-18	Canada's Maritime Traffic to the US			
14-19	Canada's Maritime Traffic From the US			
14-20	Canada's Maritime Overseas Trade			
14-21	Canada's Maritime Traffic to Overseas			
14-22	Canada's Maritime Traffic From Overseas			
14-23	Goods Carried by Canadian Air Carriers by Sector			
14-24	Operating Goods Revenues of Canadian Air Carriers by Sector			
14-25	Value of Canadian International Trade's Air Share			
14-26	Value of Canadian Exports by Air by Main Destinations			
14-27	Value of Canadian Imports by Air, Main Countries of Origin			
15-1	enger Transportation Scheduled Intercity Bus Service Corridors			
15-2	Intercity Scheduled Bus Service Carriers by Province			
15-3	Urban Transit Fleet Composition			
15-4	National Private Vehicle Use Survey, Results for Q4 of 1995 to Q3 of 1996			
15-5	Cruise Ship Traffic at Major Canadian Ports			
15-6	Changes in Air Canada's Western Routes			
15-7	City Pairs for Domestic Scheduled and Charter Passenger Traffic	279		
15-8	Domestic Enplaned and Deplaned Passenger Traffic	280		
15-9	New Direct Non-stop Transborder Air Services	282		
15-10	Passenger Traffic for Scheduled, Regional and Charter Operations, Canada - US	282		
15-11	International Air Passenger Traffic (Excluding US)	283		
16. Price	e, Productivity and Financial Performance in the Transportation Sector			
16-1	Price and Output changes for CN and CP Rail	290		
16-2	Efficiency Indicators For CN and CP Rail			
16-3	CN and CP Rail Special Restructuring Charges			
16-4	Rail Freight Cost Savings and Price Reductions.			
16-5	Financial Results for The Rail Freight Industry			
16-6	Identifiable Assets of CN and CP Rail by Geographic Segments	295		
16-7	Price and Output Changes at VIA Rail	295		
16-8	Efficiency Indicators, VIA Rail			
16-9	VIA Rail's Financial Performance Results			
16-10	Changes in VIA Rail's Fixed Assets			
16-11	Price and Output Changes, The Trucking Industry	297		
16-12	Regional Indicators of Trucking Activity	298		
16-13	Trucking Price Changes at Mid-year (AAG in Percent) for Domestic Outbound Traffic	298		
16-14				
16-15	-15 Trucking Industry Cost Savings and Price Reduction 30			
16-16	Summary Financial Results, The Trucking Industry			
16-17	6-17 Capital Expenditure in The Trucking Industry			
16-18	Price and Output Changes in The Intercity Bus Industry	301		
16-19	Efficiency Indicators in The Intercity Bus Industry	303		
16-20	Summary Financial Indicators for the Intercity Scheduled and Charter Bus Industries	304		

Table	le Title				
16. Pric	16. Price, Productivity and Financial Performance in the Transportation Sector (continued)				
16-21	Price and Output Changes of Transit Systems and Price Changes of Comparable Services				
16-22	6-22 Regional Indicators of Transit Systems				
10-23 Efficiency Indicators in Transit Systems					
10-24 Summary Financial Indicators of Transit Systems					
10-25 Capital Expenditures in Transit Systems					
10-20 Price and Output Changes for Marine Transport					
16-27 Efficiency Indicators for the Marine Transportation industry					
16-28	Financial Indicators of the Marine Transportation Industry	309			
16-29	Price and Output changes in The Airline Industry	310			
16-30	Efficiency Indicators For the Major Air Carriers and Their Affiliates	212			
16-31	Cost Savings and Price Reductions for Major Air Carriers and Their Affiliates	214			
16-32	Summary Financial Results of The Airline Industry	215			
16-33	Capital Expenditure in The Airline Industry	316			
List	of Figures				
Figure	Title	Page			
2 Tran	sportation - The Canadian Economy and Sector Productivity	- and			
2-1	Transportation Compared to Other Sectors in Canada	,			
2-2	Household Expenditures by Major Function	. 6			
2-3	Consumer Expenditures on Transportation as a Share of Total Consumption	. 9			
2-4	Personal Debt and Savings Rate	. 10			
2-5	Transportation and Economic Activity, Seasonally Adjusted Quarterly GDP	11			
2-6					
2-7	Changes in Consumers Expenditures on Transportation and Factors Affecting its Demand	12			
2-8	Proportion of Persons 65+, Selected Major OECD Countries	13			
2-9	Labour Productivity (Output per Employee)	13			
2-10	Cost and Price Changes in Transport Relative to the Economy				
2-10	Observed and Predicted Operating Ratios among the Air, Rail and Trucking Industries				
2-11	Observed and Fredicted Operating Ratios among the Air, Rail and Trucking industries.	10			
3. Gove	3. Government Spending on Transportation				
3-1	Governments' Net Expenditures on Transportation by Level	22			
3-2	Distribution of Governments' Net Expenditures on Transportation				
3-3	Total Government Revenues from Fuel Taxes and Number of Motor Vehicle Registrations				
3-4	Distribution of Transport Canada's Gross Spending on Transportation				
3-5	Distribution of Total Direct Federal Subsidies, Grants And Contributions by Mode				
3-6	Provincial/Territorial Governments' Transportation, Gross and Net Expenditures and Federal Transfers				
3-7	Gross Transportation Expenditures by Province/Territory and by Mode				
3-8	Local Government Transportation Gross and Net Expenditures and Provincial Transfers	34			
	sportation and Safety	20			
4-1	Reportable Accidents Involving Dangerous Goods	38			
4-2	Rail Crossing Accidents, Canada vs. US	41			
4-3	Number of Crossing and Trespasser Fatalities, Canada vs. US	41			
4-4	Annual Average Number of Fatalities per 10,000 Motor Vehicles Registered by Province	42			
4-5	Percentage of Road Collisions and Fatalities Involving Commercial Vehicles	43			
4-6	Motor Vehicle Fatality Rates among OECD Countries, Average for the Period 1994 - 1996	44			
4-7	Shipping Accidents	45			
4-8	Crash Test Evaluation Performance of Potential Rear Under Ride Guard	53			
5. Trans 5-1	sportation and Environment Relative Contributions of Modes to Transport GHG Emissions	60			
6. Trans	sportation and Energy				
6-1	Gasoline Retail Prices	68			
6-2	End-Use Energy Demand in Canada, by Sector	69			
6-3	Sales of Fuels Used for Transportation Activity	69			
6-4	Fuel Sales by Mode in Canada	/0			
6-5	Energy Use and Activity by Mode – Passenger Transportation	70			
6-6	Freezy Use and Activity by Mode - Freight Transportation.	/ 1			
6-7	Canadian Motor Vehicle Fuel Efficiency	71			

rigure	1 me	uge
7. Trans	portation and Regional Economies	
7-1	Structure of Provincial Economies in Terms of Provincial Gross Domestic Product	76
7-2	Imports and Exports as a Percentage of Provincial Gross Domestic Product, in Current Dollars	
7-3	Value-added of Commercial Transportation as a Percentage of Provincial Gross Domestic Product	
7-4	Total Transport Demand as a Percentage of Final Domestic Demand	
7-5	Transportation Investment as a Percentage of Total Investment	
, -	1. map of the control	
8. Trans	portation and Employment	
8-1	Transportation Employment	88
8-2	Employment, Urban Transit Companies	96
8-3	Employment, Taxi and Limo Drivers	97
8-4	Major Air Carriers Employees, by Region	98
8-5	Employment, Airport Authorities	
8-6	Employment, Canadian Port Authorities	
8-7	Average Weekly Earnings by Mode	
8-8	Average Weekly Earning by Region	
8-9	Number of Labour Stoppages in the Transportation Sector	
8-10	Labour Stoppages, Employees Involved	
8-11	Labour Stoppages in the Transportation Sector, Person-Days Lost	
9. Trans	portation and Trade	
9-1	Domestic Trade, by Type	118
9-2	Domestic Trade, by Sector	118
9-3	Intra-Provincial Trade, by Type	119
9-4	Intra-Provincial Trade, by Province	120
9-5	Inter-Provincial Trade, by Type	120
9-6	Inter-Provincial Trade, 1996, Main Trade Flows, Ontario as Origin	121
9-7	Inter-Provincial Trade, 1996, Main Trade Flows, Other Regions as Origin	122
9-8	Trends: Inter-Provincial Trade vs Exports / Imports	
9-9	Exports to World, by Type	
9-10	Imports From World, by Type	
9-11	Exports to World, US vs Non-US	
9-12	Imports From World, US vs Non-US	
9-13	Exports to the US by Modal Shares	
9-14	Imports From the US by Modal Shares	
9-15	Canada-US Trade, by Regions	126
9-16	Canada-US Trade, by US Regions	
9-17	Canada-US Trade, Main Ontario Trade Flows	
9-18	Canada-US Trade, Main Canadian Regions Trade Flows	127
9-19	Exports to Non-US Countries.	129
9-20	Imports From Non-US Countries	129
9-21	Exports to Non-US Countries by Modal Shares	
9-22	Imports From Non-US Countries by Modal Shares	
9-23	Exports to Non-US Countries by Provinces	131
9-24	Imports From Non-US Countries by Provinces	131
9-25	Exports to Non-US Countries by Modal Shares	
9-26	Imports From Non-US Countries by Modal Shares	
	The state of the s	100
10. Tran	sportation and Tourism	
10-1	Distribution of Tourism Spending in Canada	136
10-2	Tourism Spending in Canada by Province	
10-3	Quarterly Distribution of Tourism Spending on Transportation	137
10-4	Canada's International Travel Account	138
10-5	Distribution of Domestic Travel by Province	139
10-6	Domestic Travel in Canada by Purpose	140
10-7	International Travellers in Canada	
10-8	Same-day Canada/US Automobile Excursions in 1998	141
10-9	Overnight Canada/US Excursions	
10-10	1997 Canada/US Travel According to Purpose	142
10-11	Visitors to Canada from Europe	143
10-12	Visitors to Canada from Asia	144
10-13	Visitors from Countries Other Than the United States by Region	144
10-14	1997 Destinations by Province of Overnight International Travellers	145
10-15	Canadian Travel to Countries other than the IIS in 1997	145

Daga

T:41

Figure	Title	Page			
10. Tra	10. Transportation and Tourism (continued)				
10-16	Distribution of 1997 Canadian Overseas Travel by Purpose	146			
11 Tues		140			
11. 1ra	nsportation and Information Technology				
11-1	Changes in Urban Form	148			
	Toronto's Compass System	150			
11-3	1-3 Highway 40/ ETR				
11-5	Automated Mainline Clearance System	154			
11-6	Electronic Border Crossing Technology	155			
11-7	Components of a Complete Electronic Freight Tracking System.	156			
11-8	ICT Tracking System Components in Shipping	158			
11-9	Industrial Outsourcing by Production Components	159			
11-10	Projected Growth rates for Video-Conferencing in the Business Air Market	161			
11-10	Projected Growth rates for video-conferencing in the business Air Market	165			
12. Tra	nsportation Infrastructure				
12-1	Canada's Rail Network	173			
12-2	Balance of CN and CP Rail Three-Year Rationalization Plans as of December 31, 1998	174			
12-3	Cumulative CN and CP Rationalization	175			
12-4	Divestiture Status of Ports, Regional / Local / Remote	182			
12-5	Traffic Shares by Port Groups	185			
12-6	Great Lakes / St. Lawrence Seaway System	186			
12-7	St. Lawrence Seaway Cargo Movements	187			
12-8	St. Lawrence Seaway Traffic by Commodity	188			
12-9	Canada's Pilotage Authorities	190			
12-10	Pilotage Authority Total Net Income	192			
12-11	Per Cent of Aircraft Movements by Airport Category	194			
12-12	Number of Aircraft Flights per Traffic Controller	194			
12-13	NAV Canada Fee Shares	196			
12-14	Map of Airports Divestiture, 1998, National Airport System Airports	197			
12-15	Map of Airports Divestiture, 1998, Regional / Local Airports	198			
12-16	Map of Airports Divestiture, 1998, Small and Arctic Airports	198			
12-17	Canadian Distribution, Freight Forwarder Firms	204			
12-18	Markets and Modal Use, Freight Forwarder Firms	204			
12-19	Number and Location of CSW Licences by Province				
12 1.3	·				
	ustry Structure	212			
13-1	Trucking Industry Structure and Revenues				
13-2	Number of Bankruptcies, Trucking vs Total Economy				
13-3	Number of For-Hire Trucking Carriers Earning Annual Revenues of \$1 Million or More				
13-4	Bus Industry Structure and Revenues	218			
13-5	Canadian Registered Fleet	222			
13-6	Canadian Registered Fleet By Type	222			
13-7	Ferry Services, Eastern Canada	220			
13-8	Ferry Services, Central Canada	221			
13-9	Ferry Services, Western Canada	225			
13-10	Profile of the Recreational Aviation Fleet as of December 31, 1998	233			
14. Frei	ght Transportation				
14-1	Rail Revenue Tonne-Kilometres	24()			
14-2	Tonnage and Value of Rail Exports to the US by Commodity	240			
14-3	Tonnage and Value of Rail Imports from the US, by Commodity	241			
14-4	Grain Dependent Rail Lines, Grain Elevators and Capacity	243			
14-5	Total Monthly Loadings by Rail	244			
14-6	Monthly Grain Loadings by Rail	244			
14-7	Monthly Forest Loadings (Processed and Unprocessed) by Rail	245			
14-8	Monthly Automotive Loadings by Rail	246			
14-9	Annual Truck Traffic Growth in Tonne-Kilometres	246			
14-10	Domestic Versus International For-Hire Truck Traffic for Three Commodity Groups	248			
14-11	Domestic Versus International For-Hire Truck Traffic for Nine Commodity Groups, 1990	249			
14-12	Domestic Versus International For-Hire Truck Traffic for Nine Commodity Groups, 1997	249			
14-13	14.13 Applied Sale of Class & Trucks in Canada				
14-14	Inhound and Outhound Truckloads of Various Products in Western Canada	253			
14-15	Canada's Marine Traffic Flows, by Sector	254			
	· ·				

Figure	Title	Page
14. Freig	tht Transportation (continued)	
14-16	Share of Tonnage Carried by Foreign Flag Ships in Canadian Coasting Trade	256
14-17	Canada's Maritime Traffic with the US	
14-17 Canada's Maritime Overseas Trade		
14 10	Canada S Marinine O Coseda Made	201
15. Passe	enger Transportation	
15-1	Passengers and Passenger-Kilometres for VIA and Class II Intercity Carriers	268
15-2	Scheduled Intercity Bus Passengers and Bus-Kilometres	
15-3	Scheduled Intercity Bus Passengers per 100 Vehicle-Kilometres	
15-4	Scheduled Intercity Bus Fleet Size	
15-5	Scheduled Intercity Bus Service Equipment Utilization	
15-6	Charter Bus Fleet Size	
15-7	Charter Bus Fleet Utilization	
15-8	Charter Carriers' Bus-Kilometres	
15-9	Urban Transit Fleet Size	
15-10	Long-Term Trends in Urban Transit.	
15-11	Urban Transit Passengers per 100 Bus-Kilometres	
15-12	Registration of "Cars" and "Trucks"	
15-13	Registration of Motorcycles, Buses and Snowmobiles	
15-14	Domestic Passenger Traffic, by Region	
15-15	Growth in Transborder Air Traffic	
15-16	Number of Seats Offered in the Transborder Market	281
16 D :		
	e, Productivity and Financial Performance in the Transportation Sector	200
16-1	Price Changes for Exports and Rail Freight	
16-2	Cost Structure of CN and CP Rail	
16-3	Rail Cost and Price Indicators in Rail Freight	
16-4	Larger Canadian and US Railways' Operating Ratios	
16-5	CN and CP Capital Expenditures	294
16-6	VIA Rail's Cost Structure	296
16-7	VIA Rail's Unit Costs and Subsidies	296
16-8	Cost Structure of the Trucking Industry	299
16-9	Cost and Price Indicators in Trucking	300
16-10	Index of Passenger Service Prices by Mode	
16-11	Cost Structure of the Intercity Bus Industry	
16-12	Cost and Price Indicators in the Intercity Bus Industry	
16-13	Cost Structure of Transit Systems	
16-14	Cost and Price Indicators of Transit Systems.	
16-15	Marine Freight Rate Indices of Bulk Shipping and Containers	308
16-16	Cost Structure of the Shipping Industry	
16-17	Cost and Price Indicators of the Marine Transport industry	
16-18	Airline Revenues by Market Segment	
16-19	Comparison of Yields for 1997, Scheduled and Charter Passenger Services	
16-20	Cost Structure of the Airline Industry	
16-21	Productivity of Air Canada and Canadian Airlines International and Their Affiliates	
16-22	Cost and Price Indicators for Major Air Carriers and Their Affiliates	315
_		
LIST (	OF APPENDICES	
Appendix	. Title	Daga
^ ^		Page
	portation and Regional Economies	
7-1a	Total Transport Demand as a Percentage of Final Domestic Demand	
7-1b	Annual Growth, Total Transport Demand	
7-2	Investment in Transportation as a Percentage of Total Investment	86
10 75		
	sportation Infrastructure	
12-1	Airports Capital Assistance Program, Expenditures by Site and Province	207
13 Indu	stry Structure	
		227
13-1	Railway Operators by Region	231
15. Passa	enger Transportation	
15-1	Status of Transportation Status of Transborder Scheduled Air Services by Nationality	285
15-2	Status of Transborder Scheduled All Services by Nationality.  Status of Transborder Air Services as of December 31, 1998.	
15-2	International Air Services as of December 31, 1998 (Excluding Canada-US Transborder air Services)	
13-3	international An Services as of December 31, 1996 (Excluding Canada-US Transporder air Services)	400

## REPORT HIGHLIGHTS

PART A
THE ECONOMY,
PRODUCTIVITY
PERFORMANCE AND
GOVERNMENT SPENDING

# TRANSPORTATION – THE CANADIAN ECONOMY AND SECTOR PRODUCTIVITY

- In 1998, transportation accounted for 3.9 per cent of Canada's GDP.
- Investment in transportation by governments and businesses averaged \$18.8 billion per year between 1993 and 1996.

- The annual growth in domestic transportation demand in 1997 was nine per cent, 3.4 per cent more than the growth in total final domestic demand.
- On an average Canadian household budget of \$45,158 in 1998, \$6,846 or 15 per cent of the budget was spent on transportation. The car is the dominant source of household transportation expenditures, with an average of \$5,959 spent on buying, operating and maintaining it.
- The Canadian economy grew by roughly 2.8 per cent in 1998, investments and exports being the two main drivers of this growth.

- Exports grew, in real terms, by over eight per cent, despite the significant drops in Canada's exports to Japan and other Asian economies struggling with severe financial crises.
- The rate of inflation declined in 1998 in comparison to the already low rate reported in 1997.
- In 1998, transportation's GDP increased by 1.5 per cent, as opposed to the 5.4 per cent increase of 1997. Weaknesses were observed in both rail and marine, a situation caused indirectly by the financial difficulties of Japan and other Asian countries.



- The large Canadian metropolitan areas account for most of the country's strong urban population growth.
- From 1991 to 1997, transportation labour productivity increases reached an annual average of 5.8 per cent and surpassed significantly the productivity performance in the goods (1.4 per cent) and services (1.5 per cent) sectors. Between 1991 and 1997, the transportation sector's "production" increased by 44 per cent while employment increased by only 4.7 per cent.
- · Since 1981, transportation's unit costs have increased at a slower pace than the overall rate of inflation. If transportation unit costs had increased at the same rate as inflation from 1981 to 1997, total transportation costs would have been \$9.5 billion higher in 1997. More importantly, 85 per cent of the cost savings have been passed on to users through lower prices, or lower price increases. Since 1993, one quarter of the savings have been kept by the transportation carriers to restore their financial health.
- Canada pursued its efforts on the international scene towards the convergence of transportation standards, rules and regulations among countries, participating in the work of various committees of international organizations such as the International Maritime Organization, the International Civil Aviation Organization, the Organization for Economic Co-Operation and Development and the United Nations. Canada was also active in the transportation initiatives tied to NAFTA and APEC, and participated in a Western Hemisphere Transportation Ministerial meeting.

#### GOVERNMENT SPENDING

- Total government spending on transportation in 1997/98 amounted to \$17 billion.
   Municipal governments have clearly seen their transportation expenditures increased in the 1990s to a point where their net transport expenditures are almost equal to the ones made by provincial/territorial governments.
- The federal government was proposing to recover 17 per cent of its gross transportation expenditures in 1998/99.
- Total direct federal subsidies, grants and contributions to transportation were to be in the order of \$812 million in 1998/99. Air, with 32 per cent, had the largest share, followed by rail, with 30 per cent; highways and bridges, 27 per cent; marine, about ten per cent; and a fraction of one per cent going towards trucking.
- Spending on roads and highways increased in 1997/98, accounting for almost \$6 billion of provincial/territorial expenditures on transportation and so did their expenditures on transit. Federal transfers to the provinces/territories in 1997/98 increased, due largely to the Labrador ferry services buyout.
- The percentage of provincial/territorial transportation budgets spent on roads and highways varied, with Prince Edward Island at one extreme, with almost 100 per cent, and the Northwest Territories at the other, with 38 per cent. Transit spending is more significant in Quebec, Ontario and British Columbia than in any other provincial/territorial transportation budget.

# PART B TRANSPORTATION AND SUSTAINABILITY

## TRANSPORTATION AND SAFETY

- While 1998 was marked with some tragic and high-profile transportation accidents, the overall safety record of Canada's transportation system continued to improve in 1998.
- · Canadian-registered aircraft were involved in 384 accidents and 83 fatalities in 1998. Forty per cent of these accidents involved private operators. Of the 162 commercial aviation accidents, 138 were related to air-taxi or aerial-work types of operations. While the number of accidents in 1998 was up slightly from the five year average (378), the number of fatalities was below the corresponding average (87), as was the number of fatal accidents (31 vs 43).
- There were 1,081 railway accidents in 1998, four per cent fewer than in 1997, for an accident rate of 14.2 accidents per million train-miles and 100 fatalities. With respect to the 1998 rail-related accidents, 46 per cent had to do with non main-track derailments and collisions, 26 per cent with crossing accidents, and ten per cent with main-track derailments. Fatalities occurred mostly from accidents at crossings or accidents involving trespassers.
- A total of 546 marine accidents were reported in 1998. Shipping accidents have declined annually by nine per cent, on average, since 1990. A total of 530 vessels were involved in

- shipping accidents during the year, eight per cent less than in 1997. The number of fatalities increased to 47, from the 24 reported in 1997, an increase resulting from the 21 lives lost on the Cypriot-registered MV FLARE off the East Coast.
- The number of fatalities from motor vehicle accidents was 3.064 in 1997 (the most recent year for which information is available). The data shows no evidence of an increasing proportion of road collisions and fatalities involving commercial vehicles. Private automobiles accounted for 55 per cent of the total fatal collisions involving vehicles. Light duty trucks and vans had the second largest share with 24 per cent.
- There were 436 reportable dangerous goods accidents in 1998, and 12 fatalities. Two of these fatalities were caused by dangerous goods.

#### TRANSPORTATION AND ENVIRONMENT

· In 1998, federal and provincial/territorial Ministers of Transportation launched a Transportation Table on Climate Change as part of a national process led by Energy and Environment Ministers to develop a climate change strategy in response to the Kyoto Protocol. If ratified, the Kyoto Protocol would require Canada to reduce emissions of greenhouse gases to six per cent below 1990 levels by 2008 - 2012. The Transportation Table is composed of 26 representatives drawn from federal, provincial and municipal governments, transport sector private organizations, environmental groups and other stakeholders in Canada's transport system. The

- Table is to develop options by mid-1999 to reduce emissions of greenhouse gases from transportation, which is the largest source of Canada's emissions.
- In 1998, among the transportation initiatives to mitigate air quality concerns in Canada. The Minister of the Environment proposed new regulations to reduce the sulphur content in gasoline sold in Canada. There was also the development of Canada-wide standards on particulate matter and ozone; a study on airport air quality with the Aéroports de Montréal and the Montréal Urban Community: vehicle emissions inspection clinics; the International Civil Aviation Organization working group on ground source emissions; and the United Nations Economic Commission for Europe protocols on persistent organic pollutants and heavy metals under the Convention on Long Range Transboundary Air Pollution.
- Amendments to the Canadian **Environment Protection Act** (CEPA) are being proposed in a Bill introduced by the federal Minister of the Environment. For transportation, the amended Act would provide a new authority to control motor vehicle and other engine emissions, to develop a new national emissions mark for engines meeting emissions requirements, and a national fuel mark to show that fuels meet environmental standards.

#### TRANSPORTATION AND ENERGY

• Gasoline prices in 1998 were at their lowest levels in about 20 years.

- · On the R&D front, a development that has both energy and environmental impacts is the Ballard fuel cell, a zero-emission engine that converts natural gas, methanol, gasoline, or hydrogen fuel into electricity without combustion. Agreements were reached in 1998 with automobile manufacturers that will advance the penetration of fuel cell technology into the market.
- · A joint venture between Iogen, an Ottawa-based company, and Petro-Canada, has been created to look after the production of ethanol fuel.

#### TRANSPORTATION AND REGIONAL ECONOMIES

- · Prince Edward Island, Manitoba and New Brunswick have the highest provincial share of commercial transportation in Canada. In Ontario and Ouebec, commercial transportation's contribution to the Provincial Gross Domestic Product is lower than in Western Canada, due to differences in the relative importance of primary commodities in their total economic activities, differences in population density and in their proximity to major US markets.
- Private transportation makes up the largest segment of total transportation demand in all provinces, being highest in Prince Edward Island, followed by Saskatchewan. The territories have the smallest share of private transportation but the highest share of government expenditures. Higher transportation demand is observed in Eastern and Western Canada.
- Prince Edward Island and Nova Scotia had in 1996 the largest proportion of their total

investment going to transportation, more specifically on road, with Alberta and Saskatchewan at the other end of the scale.

## TRANSPORTATION AND EMPLOYMENT

- Full-time jobs directly associated with the provision of transportation services, development and maintenance of infrastructure, government services related to transportation and other associated services accounted for an estimated 6.4 per cent of all jobs in Canada in 1998. This is less than the 6.7 per cent reported in 1995.
- · During 1998, the provision of transportation services (air, marine, rail and bus carriers, trucking companies and local services such as taxi and limousine services) made up an estimated 71.6 per cent of all transportation jobs. Associated services, such as marine pilotage and travel operators and tour guides, accounted for 12.6 per cent, while the development and maintenance of infrastructure generated 11.9 per cent. Transport-related jobs in the federal, provincial and municipal governments accounted for the remaining 3.9 per cent.
- The trucking industry was the most important mode in terms of direct full-time jobs, accounting for an estimated 41.1 per cent of all transport-related employment in 1998. The air industry was the second most important, with an estimated 15.1 per cent of all jobs. Bus/urban transit, rail, local services and marine generated 7.9, 6.3, 5.1 and four per cent of all transportation jobs respectively.

- At the end of the first three quarters of 1998, average weekly earnings across all modes, including overtime, was \$729. Railway employees averaged \$990, compared to \$633 by public transit employees. The trucking industry registered a 5.2 per cent increase in average weekly earnings in 1998, compared to a 1.8 per cent increase across all modes. Average weekly earning for air and rail both declined slightly in 1998.
- Fourteen work stoppages in the transportation sector in 1998 led to the loss of 73,170 person-days. Three of the stoppages were in the air industry, leading to the loss of 33,840 person-days (53 per cent of all days lost).

## TRANSPORTATION AND TRADE

- With respect to domestic trade, intraprovincial and interprovincial trade have maintained their respective shares of 85 and 15 per cent between 1984 and 1996.
- Domestic trade, in 1996, was 431 million metric tonnes of goods split as follow between the modes: 46 per cent to rail; 42 per cent to for-hire trucking, 11 per cent to marine and one per cent to air.
- Between 1984 and 1996, intraprovincial trade grew, on average, at the annual rate of five per cent. Close to two-thirds of the intraprovincial trade was "service" related in 1996.
- Interprovincial trade grew at the average annual rate of 3.4 per cent between 1984 and 1996 but services in that trade grew at 6.1 per cent while goods experienced a 1.8 per cent annual increase. Ontario and Quebec are the most significant trade partners.

- From 1990 to 1996, international exports grew at an average annual rate of 10.5 per cent, compared to 2.2 per cent for interprovincial trade.
- In the Canada-US trade, the surface modes are the favoured choice. Ontario dominates this trade, accounting for almost two thirds of it in 1997.
- Canadian exports to the US, have grown twice as much as to other countries.

## TRANSPORTATION AND TOURISM

- In 1997, tourist spending in Canada totaled \$44 billion, 40 per cent of which was on transportation.
- Between 1991 and 1997, tourist spending in Canada grew at the rate of 2.9 per cent, and preliminary information indicates that this trend continued in 1998.
- Tourist spending on transportation in 1997 was broken down as follows: 56 per cent on air, 37 per cent on motor vehicle transportation, three per cent on intercity bus transport and one per cent on rail; the remaining share of tourist transportation expenditures went on water transport, urban transit, taxis and parking.
- Tourism represented 43 per cent of transportation spending by consumers and businesses in 1997.
- Ontario was in 1997 the destination for 35 per cent of total domestic trips, followed by Quebec (21 per cent), Alberta (14 per cent) and British Columbia (11 per cent).
- Canadians used the automobile for 91 per cent of their domestic

travel: Same-day automobile travel accounted for 64 per cent of all trips between Canada and the US.

#### TRANSPORTATION AND INFORMATION TECHNOLOGY

- · Information and communication technologies are used in transportation to maximize efficiency of functions such as "scheduling", "routing" and "administration". They are also used to track vehicles, cargo. and to transmit transport-related documents (e.g. manifests, bill of lading, invoices, ...)
- Intelligent Transportation Systems (ITS) are used to track, in real time, congestion, vehicles: to automate reactivecontrol devices such as traffic lights to control traffic more efficiently, or to automate electronic fare/toll payment.
- In a supply chain environment, information and communication technologies come into play to permit just-in-time processes integrating production, shipping and sales to streamline delivery and eliminate or minimize inventory through interconnected information systems.

#### PART C

#### **TRANSPORTATION**

- INFRASTRUCTURE AND SERVICES

#### TRANSPORTATION INFRASTRUCTURE

• In 1998, NAV Canada became a self-funded organization, using its fees to recover all the costs of its services to its customers.

- The airports in London (Ontario) and St. John's (Newfoundland) were transferred in 1998 to Canadian Airports Authorities. The airport in Saskatoon, Saskatchewan was transferred on January 1, 1999. Thirty six projects at 25 airports were approved in 1998 for funding under the Airport Capital Assistance Program, for a total funding of \$20.9 million.
- · The Canada Marine Act received royal assent on June 11, 1998. The Act defines three categories of ports: Canada Ports Authorities; regional and local ports; and remote ports. Part III of the Act establishes the new framework for the management of the St. Lawrence Seaway.
- More than 25 per cent of the Canadian rail network at the end of 1998 was owned and/or operated by regional or shortline railways. Rail rationalization activities of the two major Canadian railways took mostly the form of transfers in 1998. Discontinuances of lines in 1998 translated into a reduction of 0.7 per cent of the rail network.

#### INDUSTRY STRUCTURE

- In 1998, eight new railways came into being as a result of transfers of trackage from the two Canadian major rail carriers. While the number of shortline railways within Canada has increased significantly since the passage of the Canada Transportation Act (1996), a group of six corporations account for 89 per cent of regional and shortline trackage transferred and 71 per cent of shortline carriers created since then.
- The year 1998, as in previous years, had an important number

- of mergers and acquisitions both within the domestic trucking industry as well as between Canadian and Americans carriers
- · Within the intercity bus industry, Laidlaw Inc. continued its expansion, purchasing Voyageur Colonial, and buying a minority interest in Penetang Midland Coach Lines Ltd., an Ontario-based provider of scheduled, charter, urban transit and school bus services. Laidlaw Inc. also placed a bid to purchase Greyhound Lines Inc. of Dallas, Texas, a company independent of Greyhound Canada.
- CP Ships, a member of the Canadian Pacific Ltd. Holding. acquired South American operator Ivaran Lines, and purchased Australia New Zealand Direct Lines, the latter acquisition being subject to regulatory approval. Seaspan Coastal Intermodal Company purchased the assets of Canadian Pacific Railways west coast marine transportation business, Coastal Marine Operations.
- Canada's two major air carriers strengthened their international reach in 1998 by becoming partners in major global alliances of airlines - Air Canada with Star Alliance and Canadian Airlines International with oneworld. Two regional affiliates have become independent of their major partner, e.g. Canadian North (Air Northern) and Inter-Canadien.

#### FREIGHT **TRANSPORTATION**

· Rail traffic in 1998 did not reach its 1997 record level, showing a 3.6 per cent decrease.

- For trucking, both the domestic and transborder market generated growth but the growth in the transborder market has been surpassing the one in the domestic market since the beginning of the 1990s. General freight is responsible for a significant proportion of the growth in truck traffic.
- Domestic marine traffic continued to decline as a result of changes in the direction of Canada's international trade. International marine traffic volumes increased, a situation explained by the growth in Canada's exports. The most significant increase was observed in the Canada-US market.
- Air cargo continued to show signs of expansion.

#### PASSENGER TRANSPORTATION

- Intercity rail passenger traffic increased by one per cent in 1997 while passenger-kilometres decreased marginally.
- The number of passengers using scheduled intercity bus services increased in 1997 and reached 11.3 million.
- In 1998, international cruise ship traffic was up at all Canadian major ports.
- According to preliminary statistics for 1998, domestic and transborder traffic increased.
- The number of registered automobiles continued to increase.

## PRICE, PRODUCTIVITY AND FINANCIAL PERFORMANCE

- The transportation sector has achieved significant productivity growth in the 1990s. Productivity growth in the 1986 to 1991 period was in the order of 1.3 per cent per year, a performance to be compared to the 0.2 per cent decline in the productivity performance of the economy as a whole over the same period. After 1991, the productivity of the transport sector reached average increases of 3.2 per cent per year, a performance partly made possible as a result of deregulation and other transportation policy initiatives, as well as the upturn in the economy.
- The benefits of such productivity gains have been shared between employees, shippers/passengers and the transport industry, through higher average wages, lower transportation prices and improved profitability.
- The prices of transportation services have increased less rapidly than the average prices of the economy since 1986. Between 1986 and 1997, GDP prices increased by 2.5 per cent per year; the average annual price change in the air industry was 1.6 per cent; 0.6 per cent for rail freight rates; and 0.3 per cent for trucking average rates. Since 1991, transport prices have actually declined in nominal terms.

- Since 1991, output growth of transport industries (six per cent a year) almost doubled the performance of the economy since it emerged from the recession. This is the opposite of the trend observed in the 1980s when the average growth of transport activity (0.9 per cent) was less than the growth of the economy (2.2 per cent). Growth in the 1990s was particularly strong in trucking with an average annual increase of 9.5 per cent.
- The financial performance of private transport firms improved up until 1998. Their operating margins improved as a result of productivity gains. In 1998, the air industry showed a deterioration in profitability. The freight railway industry continued to show a strong financial performance and its average operating ratio lowered to 77 per cent. Profitability in trucking also improved.
- Public transport firms faced a different situation. VIA Rail's improved efficiency served to minimise the effect of reduced subsidy levels on user prices.
   For public transit systems as a whole, the importance of operating subsidies started to decline in 1992, and in 1997 improved productivity could be reported.

## INTRODUCTION

The 1998 annual report on the state of transportation in Canada brings together, under one cover, a unique collection of data and observations on the use of the Canadian transportation system, its performance, its safety, its impact on energy consumption and the environment, and its contribution to the economy and the well-being of Canadians.

The requirement to prepare an annual report on the state of transportation in Canada began with the passage of the *Canada Transportation Act* (1996). The Act specifies in section 52 that:

"Each year the Minister shall, before the end of May, lay before Parliament a report briefly reviewing the state of transportation in Canada in respect of the preceding year, including:

 (a) the financial viability of each mode of transportation and its contribution to the Canadian economy and the development of the regions;

- (b) the extent to which carriers and modes of transportation were provided resources, facilities and services at public expenses;
- (c) the extent to which carriers and modes of transportation received compensation, indirectly or directly, for the resources, facilities and services that were required to be provided as an imposed public duty; and
- (d) any other transportation matters the Minister considers appropriate."

This third annual report submitted by the Minister of Transport brings together the most current information on the state of Canada's transportation system. As with the previous two reports, the coverage of transportation is deliberately as comprehensive and as broad as possible. While jurisdictional considerations are not neglected, they are not used to delineate the scope of the report. Data availability, however, imposes clear limitations. As much as possible, 1998 information is reported. And when it was not available, the most current year accessible is used.

The picture of transportation presented in this report covers freight and passenger transportation, facilities and services as well as some pertinent economic, safety, energy and environmental dimensions and to a limited extent, transportation vehicles. Nevertheless, the picture is imperfect because of information gaps. For instance, it is difficult to measure the increasing importance in the global economy of critical transportation features such as "speed" and "reliability", to mention only two.

The Annual Report, where possible, allows for comparisons with previous years' reports. But when more recent information than the one reported in earlier reports is not available, the report is silent. The reader is invited to go to previous year's reports to get the information.

This year's report is divided into three parts. The two chapters of Part A provide a context for the whole report. A review of the year 1998, with an emphasis on the Canadian economy, draws attention to the relationship between Canada's economic performance and transportation. It is followed by a comparison of the productivity performance of the economy and the transportation sector and an overview of international transportation-related initiatives in 1998. The last chapter of Part A provides an overview of government spending and revenues tied to transportation.

Part B looks at transportation from a sustainability perspective. Eight chapters cover key subjects related to sustainability — safety, environment, energy, regional economies, employment, trade, tourism, and information and communication technology.

Part C, the last part of the report, examines specific elements of the Canadian transportation system. A chapter on the transportation infrastructure precedes one on the industry structure of the different modes of transportation. Then two chapters examine transportation activities, differentiating between freight and passenger transportation. The last chapter presents an overview by mode of prices, productivity and financial results.

While there is an undeniable continuity with the previous two reports, the content of this year's report is structured differently and expanded slightly. Purposely, the report will evolve from one year to another to properly address current issues and developments. To meet all of the Act's reporting requirements fully is more than a question of data availability. It is also one of pushing the conceptual knowledge barriers and developing analytical tools to arrive at measuring all the dimensions of transportation in an integrated and inter-related way. It is with this objective in mind that a research work plan is being pursued to address some of the key information gaps in the coming years. With the successful completion of a pilot program to test a new Canadian Vehicle Survey, described in the 1997 Annual Report, full implementation of this survey will be launched in 1999. The survey will address some important information gaps as it will provide activity data (vehicles-kilometres, passenger-kilometres and tonnekilometres) by type of vehicle, users, trips, commodities, road type and time.

This report is based to a large extent on data coming from sources external to the Department.

When the data originated from a mandated data-gathering organization such as Statistics Canada, the validity and reliability of the data was assumed, and therefore not challenged.

Otherwise, conscious efforts of validation were undertaken.



# THE ECONOMY, PRODUCTIVITY PERFORMANCE AND GOVERNMENT SPENDING

Transportation enables goods and passengers to be carried between and within production and consumption centres.

Transportation creates internal economies for many sectors and fosters external economies for all sectors. Therefore, transportation plays an important, if not vital, role in the productivity performance of an economy. But the need for improved transportation goes beyond purely economic considerations. Organized human activities would not be possible without transportation. As a result, transportation has always been a concern to government and has given rise to public expenditures.

## Transportation – The Canadian Economy and Sector Productivity

In 1998, the Canadian economy kept on course throughout financial twists and turns while transportation services inched forward.

In Canada, transportation is critically important, supporting all socio-economic activities. Every good or service Canadians produce or consume relies, somehow, on the transportation system.

This chapter gives an overview of the state of Canada's transportation sector and the role transportation plays in the Canadian economy. The chapter begins by looking at how important transportation is to the economy, then turns to a review of 1998 and an examination of Canada's economic performance to put into perspective what

happened in transportation this year. This chapter also examines the demand and supply of transportation to determine what was influencing the use of different modes of transport. The chapter looks at recent key demographic trends and their impact on transportation. It then turns to a comparison of the productivity performance of the economy and the transportation sector, before presenting an overview of Canadian participation in international transportation - related initiatives in 1998.

## THE IMPORTANCE OF TRANSPORTATION

There are many ways to measure the importance of transportation to the Canadian economy. This chapter will examine several, providing a solid overview of transportation's importance in the economy.

## TRANSPORTATION IN THE GDP

In 1998, transportation's Gross Domestic Product (GDP) totalled \$27.8 billion, accounting for 3.9 per cent of Canada's total GDP.

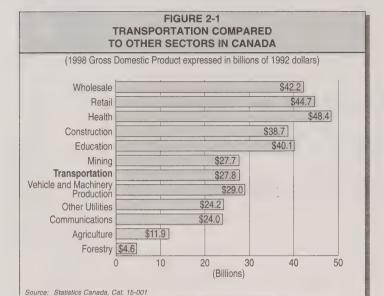


TABLE 2-1
GROSS DOMESTIC PRODUCT
PRICES AND INCOME

	1998	1997 – 1998	1991 – 1998
	(Level)	(Real % change)	(AAPC)1
GDP (billions of dollars)			
Total	718	2.8	2.6
Goods Industries	236	2.0	2.7
Services Industries	482	3.1	2.6
Transport	27.8	1.5	3.5
Trucking	11.0	4.1	7.7
Rail	4.0	-2.4	1.4
Air	4.3	3.9	5.6
Marine	1.9	-2.9	-1.6
Other <sup>2</sup>	6.6	0.1	-0.2
Income <sup>3</sup>	16,495	0.9	-0.3
Population (millions)	30.3	1.0	1.1
Prices <sup>4</sup> - Total economy	107.0	-0.4	1.2
Transport	99.8	-0.2	-0.1

Note: GDP is at factor cost and in billions of 1992 dollars.

All per cent changes are in real terms

AAPC = Average annual per cent change

Includes urban transit, taxis, inter-urban and other transport activities.
 Personal Real Disposable Income per Capita, in 1992 dollars.

Year 1992=100.0; Implicit price index of GDP used for the economy. Transport prices are estimates of Transport Canada.

Source: Transport Canada; Statistics Canada, Cat. 13-001; 15-001; 62-001 and 91-002

Figure 2-1 shows transportation's contribution to total GDP, compared with other sectors. Although transportation is not as important as wholesaling, retailing, health, construction or education, it does surpass mining, communications, other utilities, agriculture, and forestry.

#### INVESTMENT

Transportation's economic importance can be assessed in terms of how much investment is devoted to it by both governments and businesses. Governments invest in transportation infrastructure, such as roads and ports, and in machinery and equipment, such as cars and trucks. Businesses tend to concentrate their transport investment in machinery and equipment. Because transportation assets have a long life, investments are for the long term. It is, therefore, more appropriate to analyze investment over a long period of time, as opposed to a yearly analysis.

Table 2-2 compares investment in transportation to total investment in the economy (less residential construction as it is considered a non-productive investment) from 1993 to 1996.

Over this period, investment in transportation averaged \$18,767 million per year, almost one-fifth of total investment in the economy. Transportation equipment accounts for 13.3 per cent and infrastructure for 6.7 per cent of total investment in the Canadian economy. Notably, road accounts for over 87 per cent of transportation investment. All other modes of transport accounted for less than one per cent of total investment each.

## AGGREGATE DOMESTIC SPENDING

The importance of transportation can also be measured from a consumption perspective, or the "aggregate domestic spending on transportation." This totals spending on transportation investment and goods and services.

Table 2-3 shows the total transportation demand in 1991 and 1997.

Table 2-3 shows that the major items are, in order of expenditure: private transportation sales; for-hire carrier services; and government expenditures on transportation, such as infrastructure and subsidies.

Transportation is playing a stronger role in the economy, due to the fact that the aggregate spending approach takes into account "for-hire" activity as well as "in-house" transportation. In 1997, the most recent year for which information is available, domestic demand for transportation amounted to \$142.2 million, or 17.1 per cent of Canada's total final domestic demand. Annual growth in 1997 in transportation domestic demand was nine per cent, exceeding growth in final domestic demand by 3.4 per cent. If government expenses are netted out of transportation-related indirect taxes and fees, transportation domestic demand represents only 15.5 per cent of total domestic demand in Canada, while its yearly growth was 9.4 per cent.

#### TABLE 2-2 INVESTMENT IN TRANSPORTATION 1993 – 1996

(millions of current \$)						
	1993	1994	1995	1996	Average	Per Cent
Total Investment Government – Construction	85,803	93,356	96,353	101,095	94,152	100.0
Government – Construction  Government – Machinery	12,325	13,559 3,508	14,456	14,819 4,452	13,790 3,696	14.6
Business – Construction Business – Machinery	30,162	32,962	32,213	35,437		34.7
equipment	39,825	43,327	46,352	46,387	43,973	46.7
Total Transport Equipment Infrastructure	<b>15,155</b> 9,651 5,504	<b>18,754</b> 12,342 6,412	<b>19,716</b> 12,876 6,840	<b>21,441</b> 15,120 6,321	<b>18,767</b> 12,497 6,269	<b>19.9</b> 13.3 6.7
Road Equipment (e.g. cars) Roads and Bridges	<b>13,321</b> 8,493 4,828	<b>16,375</b> 11,033 5,342	<b>17,454</b> 11,632 5,822	<b>18,738</b> 13464 5,275	11,156	
Rail Equipment (e.g. locomotives) Rail Track and Roadbeds	<b>761</b> 401 360	<b>866</b> 379 487	<b>845</b> 356 489	<b>1,018</b> 507 511		0.9 0.4 0.5
Marine Equipment (e.g. ships) Marine engineering construction	<b>510</b> 267 243	<b>678</b> 186 492	<b>719</b> 274 445	<b>818</b> 364 447		<b>0.7</b> 0.3 0.4
Air	563	835	698	830	732	0.8
Equipment (e.g. aircraft) Runways incl. lighting	490 73	744 91	614 84	743 87	648 84	0.7 0.1
Source: Statistics Canada Cat. 61-223						

## TABLE 2-3 TOTAL TRANSPORT DEMAND 1991 and 1997

(Millions	of current dollar	rs)			
	19	1991		1997	
	Billions of \$	Per cent Share	Billions of \$	Per cent Share	Growth in 1997
A) Final domestic demand	693.1	100.0	832.4	100.0	5.6
B) Total transport domestic demand					
(Items 1+2+3)	108.5	15.7	142.1	17.1	9.0
C) Total less indirect taxes and fees (Items 1+2-	+5) 98.5	14.2	129.3	15.3	9.4
) For-hire carriers	26.9	3.9	36.9	4.4	10.5
Air	7.8	1.1	12.1	1.5	13.6
Rail	5.3	0.8	7.0	0.8	9.8
Water	2.3	0.3	3.4	0.4	-0.8
Truck	8.0	1.2	14.1	1.7	11.4
Private transport sales	64.4	9.3	88.3	10.6	9.8
Retail vehicle dealers (new and used)	36.9	5.3	58.3	7.0	11.7
Gasoline service stations	14.0	2.0	16.3	2.0	1.0
Retail vehicle parts and repair shops	10.8	1.6	13.7	1.6	13.1
B) Government expenditures	17.1	2.5	17.0	2.0	1.9
Road construction and maintenance	10.9	1.6	11.2	1.4	2.2
Urban transit subsidies	2.4	0.3	2.7	0.3	3.0
Other subsidies and administration	3.9	0.6	3.7	0.3	0.4
Total indirect taxes and fees	10.0	1.4	12.9	1.5	4.3
Fuel taxes	7.7	1.1	9.9	1.2	3.0
Licence fees	2.3	0.3	2.9	0.4	8.9
i) Government expenses less indirect taxes and	d fees 7.1	1.0	4.1	0.5	-4.8

Source: Statistics Canada, Special tabulation from the Income and Expenditures Accounts Division Several annual reports of transportation companies; Transport Canada

#### HOUSEHOLD BUDGET

Another interesting yardstick for measuring the importance of transportation to the economy is how much the average household spends on transportation. The average 1998 household budget is \$45,158, with \$6,846 or 15 per cent spent on transportation. In comparison, the average household spent 13.5 per cent on food, 32 per cent on housing and furnishings, 10.4 per cent on education and 4.2 per cent on health care.

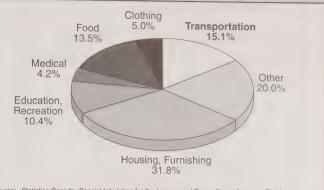
Figure 2-2 shows the average household expenditures in 1998.

Table 2-4 breaks down household spending on transportation, clearly showing the car is the dominant expenditure. In fact, 87 per cent, or \$5,959, of the \$6,846 was spent buying, operating and maintaining the automobile. The same household spent \$887 or 13 per cent on public transportation, mostly on air transportation, which accounted for over 80 per cent of public transport household spending.

Canadians' spending on transportation ranks fourth compared with eight major Organization for Economic Co-Operation and Development (OECD) countries. From 1990 to 1996, Canadians spent an average of 15.8 per cent of total spending on transportation. The United Kingdom, at 16.8 per cent, and Japan, at 11.3 per cent, are the highest and lowest spenders, respectively, among the eight countries.

Figure 2-3 shows consumer expenditures on transportation for eight major OECD countries, average between 1990 and 1996.



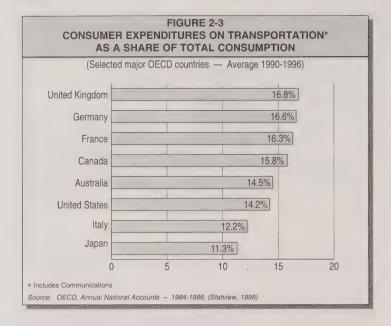


Source: Statistics Canada, Special tabulation for the Income and Expenditures Accounts Division;
Transport Canada

## TABLE 2-4 SPENDING ON TRANSPORTATION PER HOUSEHOLD

	\$ per	Per
Item	Household	cent
Vehicle purchase	3,214	46.9
New cars and trucks	2,266	33.1
Used cars and trucks	659	9.6
Bicycles and motorcycles	207	3.0
Boats	82	1.2
Fuel	1,240	18.1
Insurance	330	4.8
Other vehicle operating expenses	839	12.3
Repairs and maintenance	445	6.5
Parts and accessories	394	5.8
Other	336	4.9
Motor vehicle rental/lease	68	1.0
Parking	62	0.9
Driving lessons	206	3.0
Urban public transportation	175	2.6
Transit	134	2.0
Taxi	41	0.6
Intercity public transportation	712	10.4
Air	617	9.0
Rail	14	0.2
Intercity bus	53	0.8
Ferry and water transportation	28	0.4
TOTAL	\$6,846	100.0%

Source: Statistics Canada, Special tabulation for the Income and Expenditures Accounts Division, Transport Canada



#### IN SUMMARY

Transportation's role in the economy, and what it means to Canadians, goes beyond how much is produced or spent. All Canadians use some sort of transportation in their daily lives. Likewise, most economic activities depend on transportation in some way. Consequently, the well-being of the transportation sector is tied to that of the other sectors.

#### A REVIEW OF 1998

In general, the well-being of the transportation sector is tied to socio-economic activity.

Accordingly, transportation supply must adjust to demand. Freight transportation demand is driven by the production and consumption of goods and services, while passenger transportation demand is tied to economic and sociodemographic considerations.

Because transportation plays a strategic role in the economy, its contribution to economic development cannot be overestimated. Many events in 1998 affected both passenger and freight transportation demand. Major influences include the strong performance of the US economy, the Asian crisis, the sliding Canadian dollar and the lower oil prices. This section presents a quick overview of these events.

## ECONOMIC GROWTH: IMPORTS AND EXPORTS

In 1998, the Canadian economy grew by about 2.8 per cent, less than originally forecast. The economy grew strongly early in the year, tailed off in the second and third quarters, and ended off strongly. The slower growth in relation to the one observed in 1997 was mostly due to developments in Asia that adversely affected the demand for Canadian commodities.

The major driving forces of economic growth came from investments and exports. The rate of growth of the economy in 1998 is similar to the average of the last seven years, as shown in Table 2-1, but far from the exceptional performance of 1997 when GDP, driven by goods production, increased by four per cent. The economy continued to experience low prices and improving government balances.

Total exports increased in real terms by over eight per cent. Imports increased by almost seven per cent. Net exports, i.e. exports minus imports, accounted for almost one quarter of the economy's growth in 1998.

The increase in exports is due to Canada's trade with the US, which continued to grow, thanks to the eight years of strong US economic expansion and a lower Canadian dollar.1 Increases were prevalent in all major categories, with merchandise exports growing by almost nine per cent. Energy products are the sole exception, due to plummeting prices. Despite the strike-related shutdown at General Motors facilities in Canada. automotive exports increased by over eight per cent. Imports of US goods, more than half of which are machinery and equipment and automotive products, increased by almost six per cent.

Exports dropped to Japan and other Asian economies, which are struggling with severe financial crises. While most of Canada's exports to the US are finished goods, those to other countries are mostly resources. For this reason, the overall share of higher value-added products in total exports has increased.

<sup>1</sup> In September 1998, the Canadian dollar reached the lowest ever recorded level, at 64.1¢ US.

In Canada's trade with Japan, its most important Asian trade partner, Canada's exports dropped, in value terms, by more than 25 per cent. Almost three-quarters of Canada's exports to Japan are from the primary sectors. Imports from Japan increased by over 15 per cent, with 90 per cent of imports being machinery and equipment, automotive products and consumer goods.

Western Europe, another important world region for Canada's trade, posted an economic growth of 2.8 per cent in 1998.

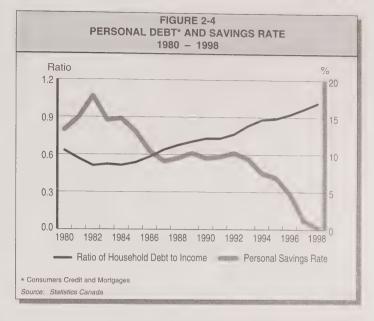
## EFFECTS ON TRANSPORTATION ACTIVITY

While trade between Canada and other Asian countries in financial crisis is relatively small—about nine per cent of Canadian exports (before the crisis)—lower exports to Asia caused a decrease in rail, shipping, and port activities.

The lower Canadian dollar enticed more US tourists into Canada, boosting domestic transport activities. Canadians found it more expensive to buy foreign goods and services, causing Canada's trade surplus to rise.

However, the lower Canadian dollar had an adverse effect on Canadian carriers' expenses. Imports of parts and vehicles cost them more as did all their other purchases outside the country in the context of their international operations (crew expenditures, fuel, food, etc.).

The oil market was soft, as were other commodities, the result of a slowdown in world output originating in Asia. Oil prices tumbled from \$18 US per barrel at the start of 1998 to less than



\$13 US by the end of the year. As can be expected, transportation costs went down.

Domestic goods production, the main propeller of freight, increased by only two per cent, while services increased by 4.2 per cent.

Real disposable income, the major factor affecting travel, increased by 1.4 per cent, the first increase in about 10 years. A major factor in the determination of passenger transportation, personal disposable income per capita increased marginally, by 0.9 per cent. Although the first increase in 10 years, it was not enough to bolster consumption. Consumer confidence was eroded by the depreciating Canadian dollar, the battered equity market and the further deterioration in household finances. Canadian consumers' level of debt reached an all-time high.

Figure 2-4 shows Canadians' personal debt and savings rate from 1980 to 1998.

A slowdown in goods production

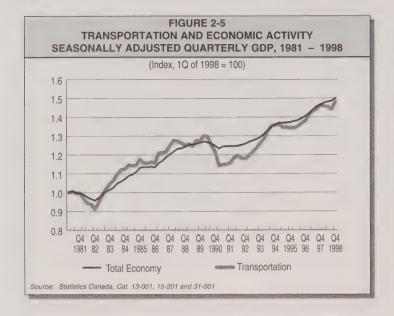
two per cent growth compared
with almost five per cent last year

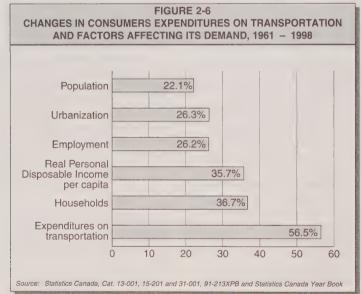
was noticeable across most
major industry groups, affecting
freight transportation. Almost the
entire primary sector, particularly
logging, forestry and mining
activities, was hard hit by low
world prices and weak global
demand.

Manufacturing GDP increased by four per cent, compared to last year's growth of 6.5 per cent. Excluding motor vehicle sales, growth in consumer demand has waned steadily, consistent with falling consumer confidence.

Despite some activity in nonresidential construction, housing construction dropped by 1.6 per cent, causing the construction industry to stay at last year's level of activity.

Total government balance in Canada remained in a surplus situation for the second consecutive year. Moreover, the federal government outperformed





its fiscal objectives for 1997/98, achieving the first surplus in 28 years.

Figure 2-5 gives a picture of transportation and economic activity from 1981 to 1998.

Overall inflation in 1998 dropped by 0.4 per cent. The

Asian flu, together with the Latin American crisis and the collapse of the Russian ruble, resulted in lower prices for a wide range of goods and services — oil, nickel, newsprint, lumber, aluminum, etc. The low commodity prices tended to offset the impact of a low dollar on import prices and kept inflation

at the bottom end of the Bank of Canada target.

#### PROVINCIAL SUMMARY

Dependence on Asian markets caused British Columbia to slip into a recession and see a net outflow of people to other provinces. The collapse in oil prices slowed growth in Alberta, driven mostly by non-residential investment. Saskatchewan and Manitoba experienced decelerating economic growth, due to the collapse of farm incomes and poor prices for natural resources. In fact, across the Prairies in general, consumer confidence was hard hit by the financial turmoil abroad.

The Ontario economy was well served by a strong domestic demand in the province, boosted by broadly based employment gains and tax cuts. In Quebec, non-residential spending bolstered the economy, mostly due to Hydro-Québec's post ice-storm rebuilding efforts and key business investment projects.

Atlantic Canada benefited from large projects: the energy sector investments in New Brunswick (Sable Island natural gas pipeline) and Nova Scotia (Cohasset/Panuke offshore oil project, Sable Island Offshore Energy Project); the aftermath of the Confederation Bridge in Prince Edward Island; and oil production from the Hibernia project in Newfoundland.

## TRANSPORTATION ACTIVITY OVERVIEW

In 1998, transportation GDP increased by a slim 1.5 per cent, compared with 5.4 per cent in 1997. Weakness was most evident in rail and marine (Table 2-1) considering that these modes increased by over eight and two per cent respectively in 1997.

Rail activity dropped by 2.4 per cent and marine transportation by almost three per cent. Trucking increased by 4.1 per cent. Air transportation increased by 3.9 per cent, compared with over 11 per cent the previous year. Urban transportation posted a 1.8 per cent increase, while interurban and other transportation grew by over five per cent.

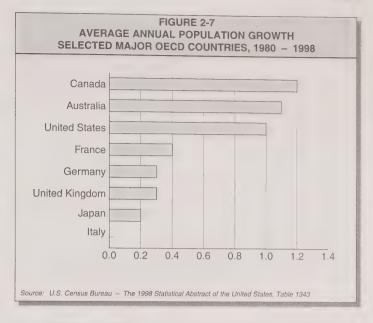
#### KEY SOCIO-DEMOGRAPHIC TRENDS

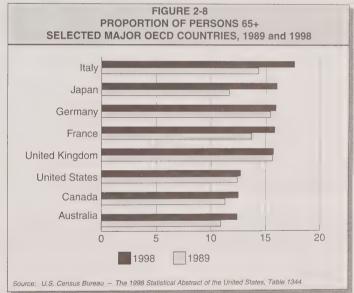
From 1981 to 1998, consumers increased spending on transportation by 56.5 per cent. This increase is due in part to population growth, which increased 22.1 per cent. It is also due to Canada's demography, such as urbanization and household formation, which influences passenger transportation expenditures.

Urbanization defines and influences the mobility of persons. Between 1981 and 1998, the urban population increased by 26.3 per cent, mostly in the larger metropolitan areas, namely Vancouver, Toronto, Calgary and Ottawa-Hull. For example, Vancouver increased by 56 per cent between 1981 and 1998. Most of that growth is centred in suburban areas, with a resulting shift in transportation needs.

Figure 2-6 shows changes in consumer expenditures on transportation and in other factors affecting its demand from 1981 to 1998.

Employment grew by 26.2 per cent (3.3 million jobs), resulting in more commuting and traveling. The number of households increased by 36.7 per cent, higher than population growth. Consequently





the number of persons per household has diminished, while the amount of travel required for shopping, recreation, etc., has increased.

Canada's 22 per cent population increase since 1981 is significant,

when compared with many industrial countries. The changing composition of the population, however, has more impact on transportation needs than the actual numbers.

Figure 2-7 illustrates the average annual population growth in major OECD countries from 1980 to 1998.

Survey results demonstrate that transportation needs vary with age, as does the type of transportation. For this reason, an aging population and "early retirees" are critical factors impacting on transportation needs.

Figure 2-8 shows the proportion of persons 65 and over in major OECD countries in 1989 and 1998.

# PRODUCTIVITY PERFORMANCE OF THE ECONOMY AND TRANSPORTATION

To understand the evaluation of a sector's productivity performance, the overall performance of the economy must be considered. This section, however, excludes the government sector and limits its scope to the business sector, broadly subdivided between goods and services.

Productivity indicators reported in this section consider changes over time, maintaining that the performance of a sector relative to the economy as a whole can best be assessed over a period long enough for the sector to distinguish its productivity growth from that of other sectors. Figure 2-9 compares the performance of the transportation sector to the economy as a whole from 1981 to 1997.

Since 1981, labour<sup>2</sup> productivity growth in the transportation sector has averaged 3.7 per cent per year, compared with 1.8 per cent in the goods sector and 1.2 per cent in the service sector. From 1981 to 1986, the transportation sector outperformed the rest of the economy by a small margin. From 1991 to 1997, the transportation sector performed particularly well, when the sector's labour productivity increased by 5.6 per cent per year.

While some of the recent productivity growth in the transportation sector was driven by the upturn of the economy since 1991, labour productivity gains in other sectors under similar economic circumstances were not as impressive. For example, increases were only 1.4 per cent per year in the goods sector and 1.5 per cent in the service sector. Transportation regulatory reforms that were initiated in the late 1980s and that matured in the 1990s, fostered an environment conducive to such productivity gains.

In simple terms, higher labour productivity can mean, for example, that fewer employees may be required to produce the same level of output. Between 1981 and 1991,

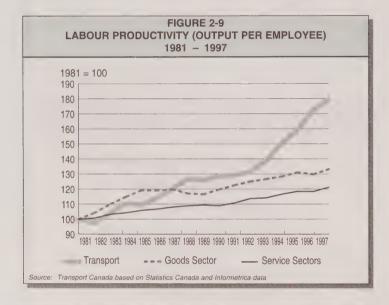


TABLE 2-5 TRANSPORTATION LABOUR INDICATORS 1981 – 1997						
Employees	1981	1986	1991	1997		
Transport (000)	251.4	237.1	222.2	236.0		
Economy (000)	8,061	8,553	9,114	9,977		
Average Cost Per Employee	1981	1986	1991	1996		
Transport (\$ thousand)	26.5	35.8	42.5	47.6		
Economy (\$ thousand)	20.5	26.4	34.2	38.3		
Unit Cost Change	1981-86	1986-91	1991-97	1981-97		
Transport (AAG in %)	3.8	1.4	(2.8)	0.5		
Economy (AAG in %)	3.7	5.0	0.5	2.9		
Sources: Transport Canada based on Statistics Canada files						

<sup>2</sup> For convenience, comparisons between transportation and the economy are limited to labour productivity. The rest of the chapter will deal with both labour and total factor productivity.

output increased by nine per cent in the transportation sector, while employment fell by 12 per cent. After 1991, transportation activity was stimulated by economic recovery and lower transportation prices (-0.6 per cent). During that period, output grew by 42 per cent while employment increased by only 6.2 per cent.

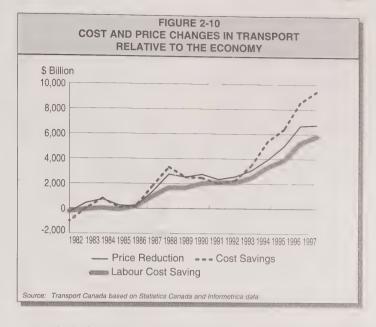
Table 2-5 shows transportation labour indicators in more detail between 1981 and 1997.

Robust productivity growth explains, in part, the transportation sector's higher salary levels compared with other sectors in the economy. These could perhaps be a product of the former regulatory environment, but they have also been supported by strong productivity performance. In 1997, the average labour cost in the transportation sector exceeded those in the economy by 21 per cent.

Unit labour costs for each unit of goods or services produced are a good measure of productivity's net effect on a firm's labour costs. From 1981 to 1997, unit labour costs in the economy as a whole increased by 57 per cent. In the transportation sector, however, they grew by nine per cent and were actually lower in 1997 than they were in 1986. In fact, if unit labour costs in the transportation sector had increased at the same pace they did for the economy as a whole, labour costs in the transportation sector would have been \$5.8 billion higher in 1997.

# PRODUCTIVITY AND PRICE PERFORMANCE

When markets are competitive and efficient, productivity gains can be returned, in part or whole,



to users in the form of lower prices. To evaluate the performance of the transportation sector, changes in transportation unit cost and prices are compared with the same changes in the general economy. When transportation costs and prices increase less rapidly than those in the economy, the net effect is considered a cost saving or a price reduction.<sup>3</sup>

Figure 2-10 illustrates the cumulative effect of cost savings and price reduction since 1981.

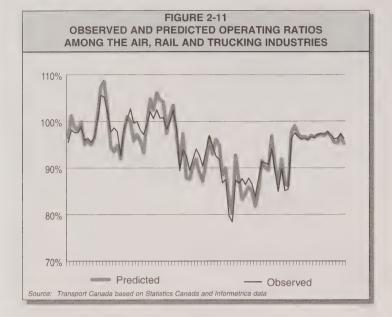
In most years since 1981, transportation unit costs have increased less rapidly than in the economy as a whole. By 1997, total costs in the transportation sector were \$9.3 billion lower than they would have been if they had increased at the same pace as the economy between 1981 and 1997. About 66 per cent of the savings came from the reduction in labour costs.

Approximately 86 per cent of the cost savings were returned to users. From 1989 to 1992, price reductions were equal to or larger than cost reductions. Over the same period, users received price reductions greater than cost savings by a ten per cent margin. Since 1993, however, more than 23 per cent of the savings have not been transferred to transportation users. Instead, these savings have been used to restore the financial health of the industry.

# PRODUCTIVITY PERFORMANCE AND FINANCIAL RETURNS

A firm's financial situation is a function, among other things, of its ability to harmonise the evolution of its unit costs with the price changes of its products and services. Firms whose prices are falling more rapidly (or increasing less rapidly) than their unit costs see their financial situation

<sup>3</sup> Savings are measured by the difference between actual carrier cost/revenues and the cost/revenues that would have accrued to them had transportation prices/costs grown at the same pace as in the economy between 1982 and 1997.



deteriorate, a situation that cannot go on for long.

The relationships between economic and financial performance indicators were tested for major rail freight carriers (CN and CP), selected air transportation firms (Air Canada and Canadian Airlines International) and the trucking industry from 1981 to 1997. Firms' financial returns, as measured by their operating ratio, were related to the price of their services sold and the cost of their factors of production. A productivity variable was then introduced to assess the role played by productivity gains in neutralising factor cost increases. The asset turnover rate was also included to take into consideration the impact of changes in capitalisation.

Figure 2-11 shows that the observed operating ratios of transportation industries are close to those estimated from the relationship between financial returns and output prices, factor costs and productivity. As expected, this suggests a close relationship between economic and financial performance indicators, despite a diverse group of industries, two recessions and major regulatory changes. In addition, it demonstrates that lower prices are sustainable if price changes are aligned with productivity gains. Otherwise, the financial performance of firms is affected.

# TRANSPORTATION AND INTERNATIONAL INITIATIVES IN 1998

As trade is liberalized around the globe, trading partners are pursuing international initiatives to increase access to markets. For Canada, it has meant working on harmonization. Canada is a regular participant in international transport-related initiatives that are coordinating the convergence of standards, rules, and regulations among many countries.

Given the increasingly complex demands on transportation, high universal standards in each mode are important to safety and the environment, as well as to fair and equitable competition. Even though change is constant and rapid, Canadians expect transportation activities to be carried out with limited risks and without hindering the process of change.

In 1998, Canada worked on transportation issues within a number of international organizations, including:

- International Maritime Organization (IMO);
- International Civil Aviation Organization (ICAO);
- Organization for Economic Co-Operation and Development (OECD); and
- the United Nations (UN).

Canada also worked on transportation issues through the North American Free Trade Agreement (NAFTA), the Asia Pacific Economic Cooperation (APEC) and a Western Hemisphere Transportation Ministerial meeting.

#### IMO

In 1998, Canada contributed to the IMO in four areas: marine safety, environmental protection, legal, and facilitation. The subjects discussed included:

- developing a uniform set of internal and external criteria for maritime administration;
- amending survey guidelines;
- reviewing a report on casualty analysis to find ways to avoid accidents in the future;
- simplifying the International Convention for the Prevention of Pollution from Ships;
- revising hazard profiles for noxious liquids carried in bulk on ships;
- reviewing guidelines for venting systems of ships carrying dangerous chemicals in bulk;
- drafting a standard for a dangerous goods manifest (a list on dangerous goods in transit, being loaded to or discharged from a ship) for ports;
- setting performance standards for electronic chart display and information systems;
- creating a ship reporting system for: the Strait of Dover/Pas de Calais, one of the busiest shipping areas; off the northeastern coast and off the southeastern coast of the United States to protect the endangered northern right whale; and the Strait of Istanbul, the Strait of Canakkale and the Sea of Marmara;
- drafting a code that sets out minimum recommended standards for shipowners' responsibilities in maritime claims;
- establishing liability for pollution damage caused by bunkers;

- establishing responsibility for wreck removal;
- making an international, uniform law for offshore mobile craft regarding collisions, salvage, arrest, limitation of liability and pollution liability; and
- setting interim guidelines for ports state control to establish compliance with the International Safety Management (ISM) code (applicable to passenger ships, oil and chemical tankers, bulk carriers, gas carriers and cargo high-speed craft of 500 gross tonnage and above).

#### **Port State Control Ministerial Conference**

Canada hosted the First Joint Ministerial Conference on Port State Control, 4 with 30 ministers or their representatives from Europe and the Pacific Rim in attendance.

At the event, Canada emphasized the need to "tighten the net" on substandard shipping. The conference attendees recommended that enforcement measures be increased and that procedures for inspecting, detaining and reporting substandard vessels be harmonized.

The recommendation includes working within the IMO to develop criteria that bind flag states and ship registries to upholding standards of quality; and rigorously applying port state control standards to ensure compliance with the ISM Code.

#### **ICAO**

In 1998, Canadian experts contributed to ICAO Panels of Experts and Working Group meetings that oversee the Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS). Many of the Canadian Aviation Regulations and Standards are derived from the SARPs and PANS. Canada's work in these meetings helps ensure safe, efficient air trayel.

Canada participated in the ICAO Continuing Airworthiness Panel of Experts, which is reviewing standards on the airworthiness of aircraft, and was a member of a major ICAO Study Group, studying the delineation between aircraft operational and airworthiness requirements.

### Universal Safety Oversight and Technical Cooperation

In 1998, Canada volunteered to be audited through ICAO's Universal Safety Oversight Audit Program, which audits compliance with the safety-related SARPs. Canada is a strong supporter of the program.

The conclusions of the interim audit report are that:

- Canada's regulatory system is almost fully compliant with ICAO standards;
- Canada's implementation system is efficient and is a good example for others to follow;
- the differences between the Canadian Aviation Regulations and the ICAO standards are minor and do not have an impact on aviation safety.

Through ICAO's Technical Cooperation Program, which enhanced civil aviation in the developing world, Canadian experts helped a number of countries, including the

<sup>4</sup> Port states enforce rigid control measures to ensure that foreign flag vessels entering their waters are in compliance with strict safety and anti-pollution standards established by various international marine treaties.

Philippines, Bahrain, Sri Lanka, Saudi Arabia, the United Arab Emirates, Indonesia, Nepal and Suriname.

In addition, Canadian experts helped provide Cabin Safety Inspector training to South Africa and Jamaica.

#### **Environmental Protection**

Again in 1998, Canada participated in ICAO initiatives on environmental protection and was a member of the ICAO Committee on Aviation Environmental Protection (CAEP). CAEP develops policy guidance on environmental matters to find solutions to noise and emissions problems and is recognized through the United Nations' Kyoto Protocol as the forum for pursing the limitation or reduction of "greenhouse gases" resulting from aviation fuels. In 1998, CAEP recommended an average reduction of 16 per cent in the levels of nitrogen oxides (NO<sub>x</sub>) that aircraft engines can emit. Canada contributes annually to CAEP working groups on both aircraft noise and engine emissions problems.

#### **Aerodromes and Airports**

In 1998, Canada acted as vice-chair for the annual International Bird Strike Committee meeting, which looks at how to control birds that interfere with the safety of aircraft during landing and take off. Canada has considerable know-how in airport wildlife control, and Canadian experts were asked to participate in ICAO-sponsored Regional Workshops on Bird Strike Hazards around the world. In addition, ICAO asked Canada to help revise its Bird Strike Hazard Guidelines.

Canada took a lead role in an ICAO international working group that is developing an International Runway Friction Index (IRFI). When runways are wet, airport control sends information on runway friction to a pilot deciding whether or not to land or take off. Currently, that reference information is not standard around the world, and a common index would help reduce any confusion. In 1998, the working group conducted tests in North Bay, Ontario, using a Falcon 20 jet aircraft and a DASH-8 turbo-prop aircraft.

In addition, Canada took the lead in the ICAO Study Group on Frangibility of Aids, establishing criteria for the frangibility of approach light towers and signs. A tower or sign that collapses easily will only cause minimal damage to the aircraft, ensuring greater protection for passengers. In 1998, the group held field testing in Blainville, Quebec, and Canada is now developing an international standard based on that work.

#### **Civil Aviation Medicine**

In 1998, Transport Canada's Physicians of Civil Aviation Medicine (CAM) attended meetings, presented papers and were elected to office on a number of international organizations. These include the Aerospace Medical Association (USA). Airline Medical Directors Association, Civil Aviation Medical Association (USA) and International Academy of Aviation and Space Medicine. CAM plays a pivotal role in the creation and harmonization of International Aviation Medical Standards

#### International Harmonization of Aviation Regulations and Standards

Outside of ICAO, Canada worked with the US and Mexico to discuss aviation issues related to the North American Free Trade Agreement (NAFTA), harmonization issues on a regional scale, and Year 2000 computer concerns.

Canada also participated in the US Federal Aviation Administration's Aviation Rulemaking Advisory Committee (ARAC), which looks at aircraft operations, such as de-icing issues, and aircraft certification, such as facilitating the import and export of aircraft and aeronautical products.

In addition, Canada entered into many bilateral agreements with foreign countries on issues related to the maintenance and the certification of aircraft. Currently, Canada is working on maintenance agreements with Israel and Japan, a certification agreement with the Joint Airport Authorities of Europe and a renewal of past agreements with the US.

#### UNITED NATIONS

Canada actively participated in the European regulation-making activity on motor vehicle safety and emissions control. This activity is managed by a committee of the United Nations organization, composed of government and industry experts representing mainly European countries but also others, including the US, Australia and Japan. Beside technical matters considered, the Committee, with the participation of Canada, developed a UN agreement, the Global Agreement, to facilitate

<sup>5</sup> To be frangible is to be breakable, i.e., if hit by an aircraft, how easily will the approach light tower or sign collapse.

international harmonization of regulations. Canada intends to sign the agreement.

#### United Nations Committee of Experts on the Transport of Dangerous Goods

One of 22 voting members, Canada participated in the United Nations Committee of Experts on the Transport of Dangerous Goods. Between import and export, Canada sees some 27 million shipments of dangerous goods per year. Almost 15 per cent of goods will cause harm, if accidentally released.

Every other year, the committee publishes a set of recommendations. In 1997/98, the committee focused on establishing performance criteria for containment, as well as updating the list of dangerous goods.

In addition, Canada contributed to another United Nations initiative to increase harmonization across international programs, such as the World Health Organization, on infectious substances.

#### **OECD**

In 1998, Canada continued its participation in the OECD 1998 2000 Road Transport and Intermodal Linkages Research (RTR) Program, which promotes co-operation on key transportation challenges, particularly in road transportation. The program influences the infrastructure policy, road safety, infrastructure investment criteria and transportation-related environmental issues of its 28 member countries.

As chair of the Steering Committee of the RTR Program, Canada plays a driving role in the program's direction. In addition, Canada is participating in all three of the RTR Program's focus areas: sustainable multimodal transportation strategies; economic performance, transportation infrastructure and management; and transportation safety and environment. Notably, under sustainable multimodal transportation strategies, members aim to improve the efficiency of domestic and international multimodal transportation. Under transportation safety and environment, members look to improve the safety and reduce the environmental impact of roads, in order to lower the resulting costs.

Canada also continued work on two OECD databases. In particular, Canada is the lead on the *International Road Research Documentation (IRRD)*, a quadrilingual (English, French, German and Spanish) worldwide database comprising more than 300,000 scientific references on road transport.

#### **NAFTA**

In 1998, Canada continued work on The Land Transportation Standards Subcommittee (LTSS), created as a result of NAFTA. The LTSS examines the compatibility of standards for truck, bus and rail transportation, and the transport of hazardous materials between the US, Canada and Mexico.

In 1998, the LTSS worked on:

- exchanging motor carrier safety data in order to implement, in a timely and effective manner, the compatibility of motor carriers;
- training Mexican federal officers to enforce the Commercial Vehicle Safety Alliance (CVSA) inspection standards;
- exchanging information on commercial vehicle emissions testing programs;

- addressing barriers and discrepancies currently affecting international trucking operations, and establishing a technical task force to see if vehicle stability and control performance criteria could be established to pursue compatibility in vehicle weights and dimensions; and
- developing dangerous goods transportation regulations and amending the emergency response guidebook to reflect changes to national and international regulations.

Canada participated in the Transportation Consultative Group (TCG), which addresses issues not specifically assigned to the LTSS. The group is working on crossborder facilitation, rail operations, electronic data interchange, application and exchange of information on advanced technologies and maritime and port facilities. In 1998, the group addressed:

- ways to establish insurance coverage for motor carriers engaged in cross-border operations, such as sharing insurance information on individual companies, setting up a system of mutual co-operation and exchanging information on licensing and registration requirements;
- setting up a facilitation agreement in order to discuss motor carrier operating requirements;
- completing the US-Canada bilateral report on railroad operating practices;
- setting up a trilateral technical working group to review regulations on rail safety;
- discussing an automated data interchange system;
- establishing a five-year cooperation plan to further work in transportation technologies; and

 creating a detailed work plan to deal with maritime and port policy, operational and safety issues.

#### **APEC**

In 1998, Canada participated in APEC's Transportation Working Group (TPT-WG). The TPT-WG supports regional economic growth by promoting an efficient, safe and regionally integrated transportation system. Since its creation in 1989. APEC has become the main forum for promoting open trade, investment and technical co-operation in the Asia-Pacific region. Advancing the APEC trade and investment agenda is a key priority for Canada as a trading nation in the this region.

Through participation in TPT-WG sub-groups, Canada:

- chaired the Maritime Safety
   Experts Group, which identified
   safety issues and problems in
   the region and is currently
   developing recommendations;
- co-chaired the Intermodal Task Force, which continued to develop an integrated transportation system, using the results of the TPT-WG Congestion Points Study;
- sat on the Special Interest Group on Intelligent Transportation Systems (ITS), which developed a report on a Framework of Standards for ITS;
- participated in the Electronic Commerce initiative, which completed an electronic commercial messages project and a TPT-WG Web site;
- participated in the Road Safety Experts Group, which identified 12 major road transportation safety problems for future studies. The studies are to focus on each problem and seek

- solutions from all APEC member economies;
- participated in the Air Services Group, which developed a report that prioritizes options for more competitive air services; and
- worked on the Maritime Initiative, which drafted a mission statement as the first step in promoting an efficient, safe and competitive operating environment for maritime transport.

#### WESTERN HEMISPHERE TRANSPORTATION MINISTERIAL MEETING

In 1998, Canada participated in a Western Hemisphere
Transportation Ministerial
Meeting, a follow-up to the 1996
Second Summit of the Heads of
Government. Participants,
including transport ministers and
private sector stakeholders,
discussed transportation
privatization and financing
mechanisms; enhancing
transportation safety and security;
and linking information networks
and transportation technology.

At the meeting, transport ministers affirmed the broad transportation objectives of the Ministerial. They also restated their intent to work together to solidify their "commitment to developing an integrated Western Hemisphere transportation system that supports the vision for increased economic and social development, trade, tourism, and co-operation among countries of the region in the 21st century, and the equitable participation and sharing of benefits among member states from integrated transportation systems."

The broad objectives include working on intermodalism; increasing transportation safety and security; preventing transportation-related disasters and environmental incidents; establishing transportation information networks; and improving co-operation on new transportation technologies. To this end, Canada will work with other countries to develop a Hemispheric Transportation Statistics System to meet transport planning and investment needs.

# GOVERNMENT SPENDING ON TRANSPORTATION

Government spending on transportation in 1997/98 went back to its 1995/96 level, due to a one time federal compensatory payment and a small increase in local government spending, which together, more than offset provincial/territorial reductions.

Traditionally, the role of government in transportation has encompassed three basic functions: production and subsidization of transportation services; economic and safety regulation; and the provision of infrastructure. Until the NTA (1987), and MVTA (1987), all transportation modes were subjected to some form of economic regulation, and included subsidized Crown corporations.

Over the past decade, however, government involvement in transportation, in particular at the federal level, has evolved from subsidizer, economic and safety regulator, and operator to safety regulator, landlord and policy maker. Most of the economic functions performed by government in transportation have now been transferred to the private sector, where market forces enable resource allocations based upon market needs. In sectors where such a transition was neither viable nor feasible, increased cost recovery from transportation users has been undertaken or envisioned. This chapter reviews the transportation expenditures and revenues of all three levels of government – federal, provincial/territorial and municipal – during this decade of transition.

It reviews expenditures and, where possible, revenues, according to transportation mode and jurisdiction. It also looks at federal transportation expenditures of departments and agencies, and federal subsidies, grants and contributions to transportation.

Dollar amounts are for the year specified and are not adjusted for inflation.

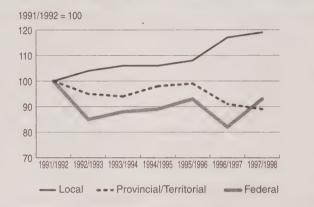
#### TABLE 3-1 GOVERNMENTS' NET EXPENDITURES ON TRANSPORTATION

(Millions of dollars)									
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98		
Federal	3,633	3,109	3,213	3,234	3,481	2,942	3,248		
Provincial/Territorial	7,871	7,438	7,340	7,642	7,762	7,136	6,979		
Local <sup>1</sup>	5,650	5,862	5,994	5,982	6,131	6,608	6,702		
Total	17,154	16,409	16,547	16,858	17,373	16,687	16,929		
Dollars per capita	610	575	572	576	587	557	560		

<sup>1</sup> Calendar year basis.

Source: Main Estimates of the Government of Canada; Transport Canada, Finance Directorate; The Canadian Transportation Agency; internal reports from various federal agencies and departments; provincial/territorial departments of Transportation; Statistics Canada, Public Institutions Division, unpublished data

# FIGURE 3-1 GOVERNMENTS' NET EXPENDITURES ON TRANSPORTATION BY LEVEL, 1991/92 – 1997/98



Source: Main Estimates of the Government of Canada; Transport Canada, Finance Directorate; The Canadian Transportation Agency; internal reports from several agencies and federal departments; provincial/territorial departments of Transportation; Statistics Canada, Public Institutions Division, unpublished data

GOVERNMENT
TRANSPORTATION
EXPENDITURES AND
REVENUES

#### TOTAL TRANSPORTATION EXPENDITURES BY LEVEL OF GOVERNMENT

When transportation budgets are voted, transportation revenues,

such as Transport Canada revenues from airport fees and leases, are typically taken into account: the departmental budget is reduced by an amount equal to revenues. When revenues are no longer available but the obligations remain, the budget is typically augmented. This accounting process, most prevalent federally, is called "vote-netting."

Table 3-1 shows net transportation expenditures by

level of government for the fiscal years 1991/92 to 1997/98 as well as total per capita transport expenditures.

From 1991/92 to 1997/98, total government net expenditures on transportation ranged from \$16.4 billion in 1992/93 to \$17.3 billion in 1995/96, with expenditures at approximately \$17 billion in 1997/98 — a trend similar to that of total economic activity.

While there is no identifiable pattern in federal or provincial/territorial spending levels, municipal expenditures show a clear upward trend. From 1991/92 to 1997/98, local net expenditures on transportation increased by an annual average of almost three per cent, compared with decreases of 1.5 per cent federally and almost two per cent for the provinces/territories.

Compared with 1996/97, net expenditures on transportation by all levels of governments in 1997/98 increased by over \$242 million, or 1.5 per cent. Both the federal and local governments showed an increase, the largest being federally at almost 12 per cent. Compared with 1991/92, however, all subsequent years showed a decrease in transportation expenditures for the federal and provincial/territorial governments.

Figure 3-1 shows the trends in net transportation expenditures by government level from 1991/92 to 1997/98.

Provincial/territorial expenditures are the highest, due to road/highway responsibilities, followed closely by local government spending. Federal expenditures on transportation are the lowest.

Figure 3-2 compares the distribution of net expenditures on transportation among the three levels of government for 1997/98.

#### REVENUES BY LEVEL OF GOVERNMENT

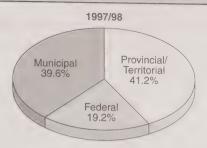
#### **Revenues Credited to Transport** Canada

Government revenues collected from a transportation activity, use of a transportation facility or a transportation service are classified into one of two categories: (1) revenues credited to a government entity; or (2) revenues, such as those raised from fuel taxes, used to finance general government activities as opposed to transportation activities. Revenues in (2) are deposited in the government Consolidated Revenue Fund.

Revenues in 1998/99, which may include cost recoveries credited to the budget, are forecast to be \$388 million. These revenues originate primarily from airport fees and leases totalling \$266 million. Other fees and recoveries yielded \$46 million, while marine fees accounted for \$24 million — their approximate annual average for the past seven years. Also included are revenues emanating from Canadian Coast Guard Services.

The Air Transportation Tax (ATT), which was used to finance air navigation services, was formerly a major source of revenues credited to Transport Canada's budget. Since 1996/97, however. ATT revenues have been credited to the Consolidated Revenue Fund. The proceeds were transferred to NAV Canada, a private not-for-profit corporation that inherited responsibility for all civil air navigation services, while it was phasing in user charges. In

#### FIGURE 3-2 DISTRIBUTION OF GOVERNMENTS' NET EXPENDITURES **ON TRANSPORTATION, 1997/98**



Source: Main Estimates of the Government of Canada; Transport Canada, Finance Directorate; The Canadian Transportation Agency; internal reports from several agencies and federal departments provincial/territorial departments of Transportation; Statistics Canada, Public Institutions Division. unpublished data

#### TABLE 3-2 **REVENUES CREDITED TO FEDERAL DEPARTMENTS' BUDGET**

(Millions of dollars)									
1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99'		
486	498	530	589	683	-	-	-		
479	380	290	302	367	324	149	266		
32	37	45	39	71	179	-	-		
9	28	28	23	21	26	25	24		
s <sup>5</sup> 42	40	36	49	57	58	56	46		
1,048	983	929	1,002	1,199	587	230	336		
**	-	-	-	12	27	37	52		
1,048	983	929	1,002	1,211	614	267	388		
	486 479 32 9 s <sup>5</sup> 42 <b>1,048</b>	1991/92 1992/93 486 498 479 380 32 37 9 28 s <sup>5</sup> 42 40 1,048 983	1991/92 1992/93 1993/94 486 498 530 479 380 290 32 37 45 9 28 28 s° 42 40 36 1,048 983 929	1991/92 1992/93 1993/94 1994/95 486 498 530 589 479 380 290 302 32 37 45 39 9 28 28 23 s° 42 40 36 49 1,048 983 929 1,002	1991/92 1992/93 1993/94 1994/95 1995/96 486 498 530 589 683 479 380 290 302 367 32 37 45 39 71 9 28 28 23 21 s° 42 40 36 49 57 1,048 983 929 1,002 1,199	1991/92 1992/93 1993/94 1994/95 1995/96 1996/97 486 498 530 589 683 - 479 380 290 302 367 324 32 37 45 39 71 179 9 28 28 23 21 26 s° 42 40 36 49 57 58 1,048 983 929 1,002 1,199 587	1991/92 1992/93 1993/94 1994/95 1995/96 1996/97 1997/98 486 498 530 589 683 479 380 290 302 367 324 149 32 37 45 39 71 179 - 9 28 28 23 21 26 25 s <sup>5</sup> 42 40 36 49 57 58 56 1,048 983 929 1,002 1,199 587 230		

Total as a per cent of federal government gross transportation expenditures

22.4 24.0 22.4 23.7 26.5 17.0 17.3 7.5

 Forecast as of January 31, 1999 of full fiscal-year actual expenditures.
 Since 1996/97, the Air Transportation Tax, formerly netted against the Transport Canada budget, has been credited to the government Consolidated Revenue Fund. In 1996/97 and 1997/98, the tax amounted to \$737.2 and \$741.8 million respectively; the forecast for 1998/99 is \$284.5 million.

3 Payments received for airport fees and leases are partially based on previous year's air traffic. The

decrease in 1997/98 is due primarily to a federal settlement paid in connection with a breach of contract in the development and management of Pearson International Airport.

4 The air navigation system was privatized as Nav Canada on November 1, 1996.
 5 Includes inter- and intra-departmental transfers for services, and various regulatory, licence and

Source: Main Estimates, Government of Canada, Part III; Transport Canada, Finance Directorate: Department of Fisheries and Oceans

November 1997, the ATT was reduced by half as NAV Canada introduced its first phase of user charges, and was dropped completely on November 1, 1998, when the organization implemented its second phase of user charges, allowing it to achieve full cost recovery.

Table 3-2 shows transport revenues credited to Transport Canada from 1991/92 to 1998/99.

#### Non-Credited Government Revenues

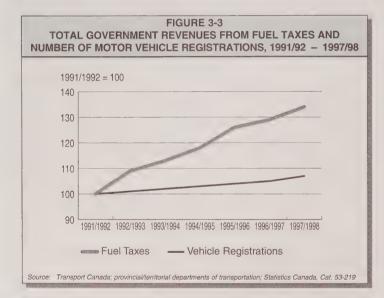
Federal and provincial/territorial government revenues collected from transport users that were not

# TABLE 3-3 GOVERNMENTS' REVENUES FROM TRANSPORTATION NOT CREDITED TO TRANSPORTATION BUDGETS

(Millions of dollars)									
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98		
Federal fuel taxes	3,158	3,226	3,312	3,427	3,895	4,053	4,185		
Provincial/Territorial Fuel taxes¹ Licence fees	4,390 2,263	4,988 2,345	5,183 2,504	5,440 2,574	5,529 2,522	5,621 2,706	5,762 2,949		
Total	9,811	10,559	10,999	11,441	11,946	12,381	12,896		

<sup>1</sup> Only transport-use tax revenues are identified here. Amounts therefore exclude provincial/territorial sales tax revenues. In the case of provinces/territories where sales taxes are levied but not specifically on fuel, an amount equal to the sales taxes has been deducted. The assumption is that part of the fuel taxes replaces provincial sales taxes. In 1997 and 1998, for example, \$695 million and \$723 million, respectively, have been deducted from fuel-tax revenues.

Source: Transport Canada; Fisheries and Oceans; provincial/territorial departments of Transportation



credited to transportation budgets have increased at an average annual rate of 4.7 per cent over the past six years. In 1997/98, revenues totalled \$12.9 billion, an increase of 4.3 per cent over 1996/97. These revenues are generated primarily by motor vehicle use: fuel taxes collected independently by the federal government and the provinces/territories, as well as permit and licence fees collected by the provinces/territories. In

addition, the Canadian Coast Guard has introduced cost recovery measures that generate a relatively small amount of revenue. Fuel taxes are the primary source of revenue, having generated, on average, 78 per cent of government transportation revenues from 1991/92 to 1997/98.

Table 3-3 shows the non-credited government revenues from transportation from 1991/92 to 1997/98.

Fuel-tax revenues have also grown at a faster rate than revenues from licence and permit fees. From 1991/92 to 1997/98, fuel-tax revenues increased by 32 per cent while licence and permit fees rose by 30 per cent. Motor vehicle registrations increased by 6.1 per cent. Except for Prince Edward Island. however, federal and provincial/territorial tax rates on road gasoline have not changed since 1996, suggesting that the increase in fuel-tax revenues is due to growing fuel consumption. This can be explained by several factors: economic growth that generated a 27 per cent increase in the transport component of the Gross Domestic Product; growing use of vans and four-wheel-drive vehicles with lower fuel efficiency than automobiles; and growing use of personal vehicles in general, due to lower fuel prices.

Figure 3-3 compares the growth rates of fuel-tax revenues and motor vehicle registrations from 1991/92 to 1997/98.

#### GROSS FEDERAL EXPENDITURES ON TRANSPORTATION

#### Federal Expenditures

Federal expenditures on transportation, which are made up of operational and capital expenditures, subsidies, grants and contributions, include the entire budgets of Transport Canada, the Grain Transportation Agency for 1993/94 and 1994/95, the Canadian Transportation Agency, the Transportation Safety Board (TSB) of Canada, the Aviation Safety Board (subsequently part of the TSB) and the Civil Aviation Tribunal. Also included are operational and capital expenditures on transportation by

other federal departments. including Fisheries and Oceans. Public Works and Government Services Canada, Parks Canada, the National Capital Commission. Agriculture and Agri-Food Canada, and Indian Affairs and Northern Development.

For the 1998/99 fiscal year, gross spending by the federal government on transportation was projected to be \$2.3 billion, before revenues are credited to the budget. This represents a decrease of more than 50 per cent in seven years: gross expenditures by Transport Canada have declined 56 per cent to approximately \$1.4 billion, while expenditures by other federal transportation agencies have declined 42 per cent to approximately \$0.9 billion.

Compared with 1997/98, gross expenditures by Transport Canada decreased by almost 40 per cent, while those by agencies dipped almost 25 per cent. The Transport Canada decrease is due primarily to a one-time \$347.6 million payment made in 1997/98 to the province of Newfoundland to take over Labrador ferry services (see Table 3-11), and to reduced payments made to NAV Canada. These latter payments are forecast to be \$216 million in 1998/99, down from \$686 million in 1997/98, with NAV Canada implementing its full cost-recovery fee structure (see Table 3-12).

In 1998/99, gross expenditures on transportation by Transport Canada and related agencies are forecast to reach their lowest levels, and represent their smallest share of the federal budget, since 1991/92.

Table 3-4 shows the federal government's gross expenditures on transportation from 1991/92 to 1998/99.

#### TABLE 3-4 FEDERAL GOVERNMENT GROSS EXPENDITURES ON TRANSPORTATION

		(Milli	ons of d	ollars)				
	1991/92	1992/93	1993/94	1994/951	1995/962	1996/97	1997/98	1998/99 <sup>3</sup>
Transport Canada					3,448			
Other <sup>4</sup>	1,479	1,108	1,046	1,259	1,244	1,055	1,087	864
Total	4,681	4,092	4,142	4,236	4,692	3,556	3,515	2,279

Total transport expenditures as % of total federal expenditures

2.4 2.5 2.6 2.1 1.4

- 1 Transport Canada expenditures include \$1,101 million for reducing the value of assets on the Accounts of Canada relating to the sale of the Canadian National Railway Company
- 2 Starting in 1995/96, Canadian Coast Guard transportation operations are included under "Other." 3 Forecast as of January 31, 1999, of full fiscal-year actual expenditures.
- 4 Includes the Grain Transportation Agency for 1993/94 and 1994/95, the Canadian Transportation Agency, the Transportation Safety Board of Canada, the Aviation Safety Board, the Civil Aviation Tribunal, as well as transportation expenditures by other federal departments including Fisheries and Oceans, Public Works and Government Services Canada, Parks Canada, the National Capital Commission, Agriculture and Agri-Food Canada, Finance Canada, and Indian Affairs and Northern Development (estimate for 98/99 N/A).

Source: Main Estimates of the Government of Canada; Transport Canada, Finance Directorate; internal reports from federal agencies and departments (see note 4)

#### **TABLE 3-5** TRANSPORT CANADA **GROSS SPENDING ON TRANSPORTATION**

(Millions of dollars)

1991/92 1992/93 1993/94 1994/95 1995/96 1996/97 1997/98 1998/99 Operating and EBP2 1,756 1,686 1,677 1,687 2,319 541 522 Capital 499 297 273 106 81 799 Grants & Contributions3 913 831 789 832 1.073 1,781 812 3,202 2,984 3,096 2,977 3,448 2.501 2,428

- 1. Forecast as of January 31, 1999, of full fiscal-year actual expenditures
- 2 Employee Benefit Plan.

Total

3 Includes transfers to Crown corporations, a \$348 million transfer to the province of Newfoundland for termination of ferry services in 1997/98, and transition-period payments of \$686 million in 1997/98 and \$216 million in 1998/99 to Nav Canada

Source: Transport Canada, Finance Directorate

For Transport Canada, the decrease in expenditures can be attributed to divestiture and commercialization in the transport infrastructure, and to the transfer of Canadian Coast Guard operations to the Department of Fisheries and Oceans.

For the other agencies, the decreases are essentially attributable to years of program reductions in grants, contributions and subsidies, and in some cases full termination of programs such as the Western Grain Transportation Act (WGTA) and

the Atlantic Region Freight Assistance (ARFA) program. The Canadian Coast Guard accounts for by far the largest share of transportation expenditures among other agencies.

#### Transport Canada Expenditures

Transport Canada expenditures for 1998/99 are projected to drop by more than 40 per cent from the previous year. This difference is attributable to one-year grants and contributions in 1997/98 that inflated spending disproportionately.

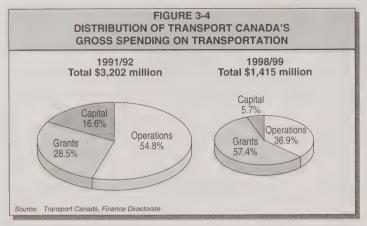


TABLE 3-6 TRANSPORT CANADA'S LEVEL OF COST RECOVERY										
(Millions of dollars)										
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/971	1997/98	1998/99²		
Total revenues Total expenditures Net expenditures	1,048 3,202 2,154	983 2,984 2,001	- /	1,002 2,977 1,975	1,199 3,448 2,249	2,501	, ,	336 1,415 1,079		
Cost recovery (%)	32.7	32.9	30.0	33.7	34.8	23.5	9.5	23.7		
1 Since 1996/97, the Air Transportation Tax, formerly netted against the Transport Canada budget, has been credited to the government Consolidated Revenue Fund. In 1996/97 and 1997/98, the tax amounted to \$737.2 and \$741.8 million, respectively; the forecast for 1998/99 is \$284.5 million.  2 Forecast as of January 31, 1999, of full fiscal-year actual expenditures.  Source: Transport Canada, Finance Directorate										

Table 3-5 shows Transport Canada's gross expenditures on transportation from 1991/92 to 1998/99.

When compared with Transport Canada expenditures in 1991/92, projected expenditures for 1998/99 represent a decline of more than 50 per cent. The largest budget reductions are in operating expenditures, a decrease attributable to the commercialization of airports and other divestiture initiatives. In the 1997/98 expenditures, there was still a contribution to NAV Canada as well as a one time grant to Marine Atlantic Ltd. operating expenditures, which accounted for almost 55 per cent of the Transport Canada budget in 1991/92, but

now comprises approximately 37 per cent of the budget.

The relative importance of grants and contributions has more than doubled since 1991/92, while their actual levels have remained fairly stable.

Figure 3-4 compares the distribution of Transport Canada's gross expenditures on transportation in 1991/92 with projections for 1998/99.

#### Transport Canada Cost Recovery

Up until 1995/96, Transport Canada was recovering approximately one-third of its expenditures. The cost recovery level is now approximately one quarter. During the past three years, large grants and contributions were provided, such as those for the Labrador ferry service buyout and payments to NAV Canada. In addition, a major revenue source, the Air Transportation Tax, was no longer allocated to Transport Canada.

Table 3-6 shows Transport Canada's level of cost recovery from 1991/92 to 1998/99.

# FEDERAL SUBSIDIES TO TRANSPORTATION

To facilitate transportation and related services across Canada, the federal government employs three mechanisms. First, it sets transportation policies, and safety rules and regulations, to ensure efficient and safe transportation. Second, it fulfils statutory obligations to provide transportation services, such as by directly subsidizing transportation entities. Third, it provides facilities and services through its own operations, which are funded by departmental or agency budgets.

#### **Direct Federal Subsidies**

Until recently, direct federal subsidies, grants and contributions to Crown corporations, agencies and other entities accounted for much of federal expenditures on transportation. During the past several decades, tens of billions of dollars were spent on the Canadian transportation system, with \$8 billion expended during the past six years. Some payments are tied to constitutional obligations, such as subsidies for ferry services, and, consequently, have been in effect for quite a large number of years.

Recently, market forces have played a prominent role in subsidization by stimulating policy changes that have reduced subsidies, such as those to VIA Rail, or eliminating others, such as those for the transport of grain from western Canada under the WGTA and for the ARFA program.

Some subsidies are still being paid, however, such as those to ferry services and to smaller airports to assist with capital expenditures. Additionally, in exchange for an annual subsidy of \$41.9 million a year (in 1992 dollars), the federal government signed an agreement with Strait Crossing Development Inc. to finance, build and operate the Confederation Bridge, linking the provinces of Prince Edward Island and New Brunswick, for 35 years beginning in 1997/98. Payments for the first two years were made by Public Works and Government Services Canada and are reflected in "Other" in Table 3-4, while subsequent annual payments will be made by Transport Canada. The agreement contains an escalation rate tied to the consumer price index.

Table 3-7 compares direct federal subsidies by transportation mode from 1993/94 to 1998/99.

Total direct federal subsidies. grants and contributions will be \$812 million in 1998/99, a decrease of 25 per cent from 1996/97. The largest share is currently distributed to air transportation, a situation that will change with the end of grants and contributions to NAV Canada. Rail had previously received the largest share, with two-thirds in 1993/94, but will receive less than one-third in 1998/99.

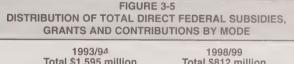
Figure 3-5 compares the distribution of subsidies by mode in 1993/94 with those in 1998/99.

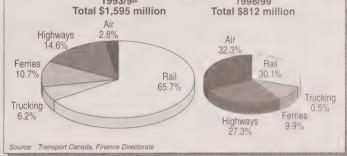
TABLE 3-7 **DIRECT FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS** BY MODE

(Millions of dollars)									
	1993/94	1994/95	1995/96	1996/97	1997/98 1	998/991			
Rail	1,044.7	1,015.2	567.2	280.6	257.0	244.2			
Highways and bridges	232.5	243.4	284.9	317.1	294.0	221.1			
Trucking	97.5	98.5	39.5	3.9	4.5	4.0			
Ferries and marine facilities	170.9	183.5	166.9	148.1	479.7	80.4			
Air	44.1	25.4	35.5	327.0	732.4	261.8			
Other <sup>2</sup>	5.7	3.8	4.5	3.4	13.5	.4			
Total	1,595.4	1,569.8	1,098.5	1,080.1	1,781.1	811.9			

Forecast as of January 31, 1999, of full fiscal-year actual expenditures.
 Includes \$13.3 million in 1997/98 for withdrawal of the Royal Canadian Mounted Police from International

Source: Transport Canada, Finance Directorate





#### Rail

Rail has undergone the greatest drop in subsidies of all transportation modes in Canada, with total rail subsidies in 1998/99 representing only 30 per cent of total direct federal subsidies for transportation. The ratio of these subsidies to total rail revenues has decreased from about 15 per cent in 1993/94 to less than four per cent in 1997/98.

VIA Rail receives the majority of rail subsidies, grants and contributions, with 80 per cent in 1998/99. The level of subsidies provided to VIA Rail, however, has been cut by more than

40 per cent during the past six years. Subsidies for transporting grain under the WGTA and for supporting general freight transportation in the Atlantic provinces and eastern Quebec under the ARFA program, meanwhile, were terminated in 1995/96. In its peak year of 1994/95, the WGTA accounted for approximately 64 per cent of rail subsidies and more than 40 per cent of transportation subsidies.

Table 3-8 shows all direct federal subsidies for passenger and freight rail transportation from 1993/94 to 1998/99.

# TABLE 3-8 FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS RAIL

	(Millior	ns of dolla	rs)			
	1993/94	1994/95	1995/96	1996/97	1997/98	1998/991
Freight	683.3	696.1	248.1	24.9	26.6	29.5
WGTA	633.0	644.0	209.8	-	-	
ARFA	9.4	9.3	2.2	-		-
Branch lines	15.3	17.4	9.7	-	-	-
Hopper cars	17.8	19.1	18.2	17.1	19.0	21.0
Other	7.8	6.3	8.2	7.8	7.6	8.5
Passenger	351.8	311.1	310.9	248.2	222.9	207.5
VIA Rail	342.7	301.0	301.0	235.8	216.2	200.5
Non-VIA	8.9	9.9	9.7	12.2	6.5	6.5
Other	.2	.2	.2	.2	.2	.5
Grade Crossings	9.6	8.0	8.2	7.4	7.5	7.2
Total - Rail	1,044.7	1,015.2	567.2	280.5	257.0	244.2

<sup>1</sup> Forecast as of January 31rst 1999 of full fiscal-year actual expenditures.

Source: Transport Canada, Finance Directorate

# TABLE 3-9 FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS HIGHWAYS AND BRIDGES

11101									
(Millions of dollars)									
	1993/94	1994/95	1995/96	1996/97	1997/98	1998/991			
Highway Agreements	193.5	209.8	207.7	214.4	166.9	129.6			
Transition re ARFA	-	-	48.7	74.8	101.5	67.8			
Other	3.3	1.0		-	-				
Total - Highways	196.8	210.8	256.4	289.2	268.4	197.4			
Montreal bridges <sup>2</sup>	35.7	32.6	28.5	27.9	25.6	23.7			
Total - Highways and Bridges	232.5	243.4	284.9	317.1	294.0	221.1			

<sup>1</sup> Forecast as of January 31rst 1999 of full fiscal-year actual expenditures.

Source: Transport Canada, Finance Directorate

# TABLE 3-10 FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS TRUCKING

(Millions of dollars)								
	1993/94	1994/95	1995/96	1996/97	1997/98	1998/991		
ARFA	96.2	97.8	35.4					
National Safety Code		-	3.7	3.9	4.5	4.0		
Other <sup>2</sup>	1.3	0.7	0.4	-	-			
Total - trucking	97.5	98.5	39.5	3.9	4.5	4.0		

<sup>1</sup> Forecast as of January 31, 1999 of full fiscal-year actual expenditures.

Source: Transport Canada, Finance Directorate

#### Highways and Bridges

During the past few decades, federal subsidies for highways and bridges have primarily taken the form of contributions under bilateral cost-sharing agreements with individual provinces, territories and, occasionally, municipalities. These subsidies are forecast to be \$221 million in 1998/99, down from \$294 million the previous year. About 60 per cent of subsidies for highways and bridges are typically allocated to highway agreements.

When the ARFA program, administered by the Canadian Transportation Agency, was terminated on June 30, 1996, \$326 million was made available to the Atlantic provinces and eastern Quebec, an amount provided over six years primarily to fund road upgrading. To date, almost \$300 million has been allocated.

In 1998/99, subsidies for highways and bridges are forecast to account for close to one third of all federal government direct subsidies.

Table 3-9 shows the breakdown of federal subsidies to highways and bridges from 1993/94 to 1998/99.

#### Trucking

Since the ARFA program was terminated in 1995/96, subsidies to trucking activity have been minimal. From 1996/97 to present, the only contribution to this mode has been to the provinces and territories for the implementation of the National Safety Code. Payments to trucking have averaged about \$4 million per year, which make subsidies to trucking in 1998/99 represent less than 0.5 per cent of total federal transportation subsidies and contributions.

<sup>2</sup> Jacques Cartier and Champlain Bridges Inc.

<sup>2</sup> Grants to associations and institutes.

Table 3-10 shows total federal subsidies to trucking from 1993/94 to 1998/99.

#### Marine

Federal subsidies for ferries and marine facilities in 1998/99 will be approximately \$80 million, the lowest of any year. Two events in that fiscal year are responsible for this. One, the completion of the Confederation Bridge means that ferry services, and thus the annual \$60 million subsidy for them, are no longer required. Second, the annual subsidy paid to Marine Atlantic Ltd. for providing other services required before the Confederation Bridge (about \$60 million a year) stopped.

Transport Canada continues to subsidize ferry services operated by Marine Atlantic Inc. between the provinces of Newfoundland and Nova Scotia. This subsidy will be \$26.8 million in 1998/99 and is one of Transport Canada's remaining constitutional obligation to provide transportation services to specific regions across Canada. Marine Atlantic also received a one-time compensatory payment in 1997/98. The department had been subsidizing services in regions that could not be serviced without the carriers incurring a loss. Although not considered to be constitutional obligations. subsidies such as the WGTA were considered to be in the public interest and were referred to as "imposed public duties." All such payments to carriers have been eliminated.

In 1998/99, subsidies to marine will represent about 10 per cent of total direct federal subsidies to transportation, the same percentage as in 1993/94.

Table 3-11 shows federal subsidies to the marine sector from 1993/94 to 1998/99.

# TABLE 3-11 FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS MARINE

	IVI	ARINE				
	(Million	ns of dolla	ırs)			
	1993/94	1994/95	1995/96	1996/97	1997/98	1998/991
Marine facilities and services						
Pilotage authorities	7.3	4.3	5.1	-		
Canartic Marine Inc.	2.7	-	-	-	-	
Canada Ports Corp.	.7	.9	1.9	2.5	0.7	10.4
St. Lawrence Seaway Authority	-	-	-	-	-	
Port Divestiture Fund	-	-	-	0.1	1.5	1.2
Other <sup>2</sup>	1.5	1.8	10.1	-	4.2	7.5
Sub-total	12.2	7.0	17.1	2.6	6.4	19.1
Ferries						
Marine Atlantic Inc.	129.3	112.4	100.0	97.2	91.3	29.1
Nfld. South Coast ferries	-	31.0	19.0	5.0	~	
New Brunswick Manan ferry	-	-	-	13.0	-	-
BC ferries	18.4	22.8	21.3	21.8	21.9	22.0
Bay of Fundy Ferry Services	-	-		-	3.3	3.2
Other East Coast ferries	11.0	10.3	9.5	8.5	9.2	7.0
Labrador ferry services buyout	-		-	-	347.6	-
Sub-total	158.7	176.5	149.8	145.5	473.3	61.3
Total - Marine and Ferries	170.9	183.5	166.9	148.1	479.7	80.4

<sup>1</sup> Forecast as of January 31, 1999, of full fiscal-year actual expenditures

Source: Transport Canada, Finance Directorate

#### Air

Federal direct subsidies and contributions to air activities, forecast to be \$262 million for 1998/99, represent almost one third of total federal subsidies and contributions to transportation. They are divided among NAV Canada, airports and aviation.

Federal contributions to NAV Canada have accounted for approximately 90 per cent of subsidies and contributions to the air sector in the past three years. The federal contribution to NAV Canada is a temporary transfer of the Air Transportation Tax revenues. The transfer is staged with NAV Canada's implementation of full cost recovery from air navigation fees.

Canada's 26 major airports, owned by Transport Canada, comprise the National Airport System (NAS). The operation and full financial responsibility for many NAS airports, however, has been transferred to local authorities under the National Airports Policy of 1994. NAS airports not yet transferred are still operated by Transport Canada, but costs tied to their operations (Table 3-13) are not reported here as a subsidy.

Transport Canada is also transferring both ownership and operational responsibility for local and small airports to local authorities. These airports will continue to receive subsidies for a certain number of years. To date, total subsidies to airports have ranged from \$25 million in 1994 to \$46 million in 1998/99.

Aviation subsidies, which have not exceeded \$1 million annually since 1993/94, include contributions to the International Civil Aviation Organization and

<sup>2</sup> In 1995/96, this item includes a grant of \$10 million to Newfoundland for the operation of ports.

#### **TABLE 3-12** FEDERAL SUBSIDIES, GRANTS AND CONTRIBUTIONS

(Millions of dollars)									
Airports	1993/94	1994/95	1995/96	1996/97	1997/98	1998/991			
Non-NAS <sup>2</sup> airport operations	14.2	12.0	7.5	4.7	3.3	2.7			
Local airports	14.6	8.0	10.0	.8	.2	-			
Non-NAS airports under NAP <sup>3</sup>	-	-	11.5	16.3	16.7	10.0			
Airport Capital Assistance Prog	]	-	1.7	9.4	21.2	31.0			
Other⁴	14.3	4.9	4.5	3.9	4.8	1.9			
Total Airports	43.1	24.9	35.2	35.1	46.2	45.6			
Aviation	1.0	.5	.3	.2	.4	.4			
Nav Canada	-		-	291.7	685.8	215.8			
Total Air	44.1	25.4	35.5	327.0	732.4	261.8			

- Forecast as of January 31, 1999, of full fiscal-year actual expenditures.
- 2 National Airports System3 National Airports Program
- 4 Includes a subsidy of \$13.3 million to other airports in 1993/94.

Source: Transport Canada, Finance Directorate

#### **TABLE 3-13** FEDERAL EXPENDITURES ON TRANSPORT FACILITIES AND SERVICES

	(Million	s of dolla	rs)			
	1993/94	1994/95	1995/96	1996/97	1997/98	1998/991
Airports operations (NAS <sup>2</sup> and	non-NAS	)				
Operating expenditures	244.5	245.3	238.3	255.2	123.0	91.1
Capital expenditures	135.8	146.0	135.7	123.4	54.5	40.8
Total gross expenditures	380.3	391.3	374.0	378.6	177.5	131.9
Less revenues	(291.3)	(303.3)	(367.9)	(324.6)	(149.6)	(265.6)
Airports operations						
Net expenditures	89.0	88.0	6.1	54.0	27.9	(133.7)
Air navigation system	128.2	96.1	29.6	363.7	N/A	N/A
Harbours and ports						
Operating expenditures	28.5	30.1	33.6	28.5	27.4	23.2
Capital expenditures	23.8	23.1	11.3	11.9	1.9	4.9
Total gross expenditures	52.3	53.2	44.9	40.4	29.3	28.1
Less revenues	(13.1)	(12.9)	(17.1)	(20.3)	(20.7)	(15.9)
Harbours and ports						
Net expenditures	39.2	40.3	27.8	20.1	8.6	12.2
Marine safety						
Operating expenditures	N/A	N/A	31.8	32.5	32.6	30.8
Capital expenditures	N/A	N/A	1.3	1.1	.2	1.5
Total gross expenditures	N/A	N/A	33.1	33.6	32.8	32.3
Less revenues	N/A	N/A	(3.8)	(5.4)	(7.8)	(8.1)
Marine safety			` '	, ,	` '	` ′
Net expenditures	37.7	36.4	29.3	28.2	26.8	24.2
Coast Guard services <sup>3</sup>						
Total gross expenditures	588.8	530.8	533.4	540.2	522.8	523.5
Less revenues	N/A	N/A	(11.5)			
Coast Guard services			(1110)	(2)	(57.10)	(3=: .)
Net expenditures	588.8	530.8	521.9	512.9	485.5	471.1
Total	882.9	791.6	619.7	978.9	547.0	373.8

- 1 Forecast as of January 31, 1999, of full fiscal-year actual expenditures.
- 3 Includes expenditures on marine navigation systems, icebreaking and Arctic operations, search and rescue and fleet management. For years prior to 1995/96, Coast Guard expenditures are included in Transport Canada figures. Marine safety is an expenditure unaccounted for in previous annual reports.

Source: Transport Canada, Finance Directorate and the federal Department of Fisheries and Oceans

amounts owed under other international agreements for air navigation and airways.

Table 3-12 shows federal subsidies to the air sector from 1993/94 to 1998/99.

#### Facilities and Services Provided at Federal Expense

In addition to directly subsidizing transportation services, the federal government provides transportation facilities and services through federal operations that are funded by various departments and agencies. These include airports, harbour and port operations, marine safety programs, and services rendered by the Canadian Coast Guard (now part of the Department of Fisheries and Oceans).

Expenditures on these facilities and services have been declining, as Transport Canada and Fisheries and Oceans reduce their operational responsibilities in the transportation system. The 1998/99 forecast of \$374 million is well under half the expenditure total of five years ago. Additionally, revenues from airport operations in 1998/99 will, for the first time, exceed total gross annual expenditures.

Table 3-13 shows gross and net federal spending on transportation facilities and services from 1993/94 to 1998/99.

#### PROVINCIAL/TERRITORIAL EXPENDITURES ON Transportation

In 1997/98, provincial and territorial gross spending on transportation totalled approximately \$7.6 billion. This represents an increase of 2.5 per cent from the previous year, compared with a decrease of eight per cent from 1995/96 to 1996/97. Capital and operating expenditures, which include salaries, each accounted for approximately 35 per cent of gross spending, while transfers accounted for 30 per cent.

Spending on roads and highways accounts for the vast majority of provincial/territorial expenditures on transport, amounting to almost \$6 billion in 1997/98, up three per cent from the previous year. Spending increased to \$1.3 billion on transit, and to \$96 million on marine transportation. Expenditures on rail and air decreased. Multimodal spending, which includes spending on more than one sector and on general administration, increased to \$172 million.

Table 3-14 shows provincial/ territorial spending on transportation by mode from 1991/92 to 1997/98.

Federal transfers to the provinces/territories in 1997/98 almost doubled to \$638 million. increasing the share of these transfers in total gross provincial/territorial spending on transportation to eight per cent, compared with four per cent the previous year. Approximately 99 per cent of these transfers were for roads and highways. Included was \$348 million to Newfoundland for the Labrador ferry services buyout, an amount that, if excluded from calculations, means there was a ten per cent drop in federal transfer payments to provinces.

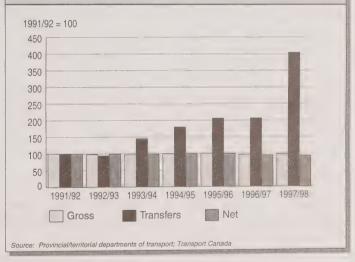
In 1997/98, provincial/territorial gross expenditures on transportation accounted for less than 5 per cent of their total expenditures. Total transportation spending net of federal transfers dropped by almost two per cent to \$7 billion in 1997/98.

**TABLE 3-14** PROVINCIAL/TERRITORIAL GOVERNMENT EXPENDITURES ON TRANSPORTATION BY MODE

		(Million	ns of dolla	rs)			
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98
Air	117	99	91	89	105	102	78
Water	169	143	126	130	99	87	96
Rail	16	16	22	19	27	11	2
Roads and Highways	6,144	5,885	5,906	6,185	6,376	5,802	5,977
Transit	1,369	1,213	1,215	1,308	1,287	1,275	1,294
Multimodal	210	208	208	190	193	159	172
Total Gross Transpor	rtation						
Expenditures	8,025	7,564	7,568	7,921	8,087	7,436	7,619
Less federal transfers	(154)	(126)	(228)	(279)	(325)	(301)	(638)
Total Net Transporta	tion						
Expenditures	7,871	7,438	7,340	7,642	7,762	7,135	6,979
Gross Transportation	Expendi	tures as	% of Tota	al Local G	Governme	nt Expen	ditures
	5.4%	4.9%	4.9%	5.0%	5.0%	4.7%	4.8%

Source: Provincial/territorial departments of transport: Transport Canada

#### FIGURE 3-6 PROVINCIAL/TERRITORIAL GOVERNMENTS' TRANSPORTATION **GROSS AND NET EXPENDITURES AND FEDERAL TRANSFERS** 1991/92 - 1997/98



PROVIN	ICIAL/TE	RRITO	RIAL TE		TABLE: ORTAT 1991/9	ION EXP	ENDITU	JRES B	Y JURI	SDICTIO	ON	
				(M	lillions of o	dollars)						
	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yk.	N.W.T.
Air	11.1	0.0	0.0	0.0	31.8	24.8	7.3	2.3	4.8	11.6	3.3	20.5
Water	13.5	0.0	7.2	10.3	37.3	31.0	1.1	1.2	1.3	55.8	0.0	10.1
Rail	0.0	0.0	0.0	0.6	2.6	0.0	0.0	0.0	1.0	11.5	0.0	0.0
Roads and Highways	162.8	76.4	279.3	321.3	1,008.8	2,028.1	219.4	249.0	656.2	1,047.8	45.1	49.4
Transit	0.0	0.0	4.9	0.0	483.2	609.8	21.2	0.6	20.9	227.9	0.0	0.0
Multimodal	0.0	0.2	0.3	0.0	106.9	38.6	5.4	0.0	55.5	0.0	0.0	3.0
Gross Transportation												
Expenditures	187.4	76.6	291.8	332.2	1,670.6	2,732.3	254.4	253.1	739.7	1,354.7	48.4	82.9
less federal transfers	(70.0)	(4.0)	(8.8)	(19.7)	(7.6)	(0.5)	(3.7)	(0.5)	(3.0)	(18.8)	(14.3)	(2.6)
Net Transportation												
Expenditures	117.4	72.6	283.0	312.5	1,663.0	2,731.8	250.7	252.6	736.7	1,335.9	34.1	80.3
Gross Transportation 8	Expenditur	es as a 9	6 of Tota	Provin	cial Gove	rnment Ex	penditur	es				
	6.0%	9.9%	5.9%	7.5%	4.3%	4.8%	3.7%	5.2%	5.1%	7.1%	12.7%	7.2%
Provincial Share of Gro	oss Transp	ortation	Expendi	tures								
	2.3%	1.0%	3.6%	4.1%	20.8%	34.1%	3.2%	3.2%	9.2%	16.9%	0.6%	1.0%
Source: Provincial territorial of	departments of	of Transport	Transport	Canada								

				(M	lillions of o	dollars)						
	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yk.	N.W.T
Air	8.7	0.0	0.0	0.0	3.7	7.5	8.3	2.5	1.8	1.7	5.6	38.0
Water	13.5	0.0	4.6	13.5	39.1	9.2	0.0	1.7	1.6	4.7	0.0	8.0
Rail	0.0	0.0	0.0	0.5	0.1	0.0	0.0	1.2	0.0	0.0	0.0	0.0
Roads and Highways	165.6	75.8	204.8	381.0	1,175.5	1,971.3	240.9	233.3	617.6	822.9	54.8	33.6
Transit	0.0	0.0	0.0	0.0	248.5	736.5	17.9	2.2	0.0	288.6	0.0	0.0
Multimodal	0.0	0.3	0.0	0.0	80.7	57.6	1.3	0.0	23.3	0.0	0.0	8.5
Gross Transportation												
Expenditures	187.7	76.1	209.4	395.0	1,547.6	2,782.1	268.4	240.8	644.3	1,117.9	60.4	88.0
less federal transfers	(412.2)	(10.6)	(46.0)	(70.0)	(24.3)	(35.5)	(0.2)	(16.2)	(0.6)	(6.2)	(14.8)	(1.5
Net Transportation												
Expenditures	-224.5	65.5	163.4	325.0	1,523.3	2,746.6	268.2	224.6	643.7	1,111.7	45.6	86.6
Gross Transportation I	Expenditu	res as a 9	6 of Tota	Province	cial Gove	rnment Ex	penditur	es				
	5.5%	10.1%	3.1%	9.0%	3.8%	4.6%	3.8%	4.7%	4.3%	4.6%	13.7%	6.7%
Provincial Share of Gro	oss Trans	oortation	Expendit	ures								
	2.5%	1.0%	2.7%	5.2%	20.3%	36.5%	3.5%	3.2%	8.5%	14.7%	0.8%	1.20

Figure 3-6 illustrates the stability of provincial/territorial gross and net expenditures on transportation, and the relative increase in federal transfers, from 1991/92 to 1997/98.

While transportation spending as a percentage of total budgets averaged almost 5 per cent across Canada, percentages in individual provinces and territories ranged from 14 per cent in the Yukon to three per cent in Nova Scotia.

In terms of share of total gross provincial/territorial expenditures on transportation. Ontario and Ouebec accounted for more than 57 per cent in 1997/98, while British Columbia and Alberta accounted for 23 percent. The distribution by jurisdiction is generally unchanged from 1991/92.

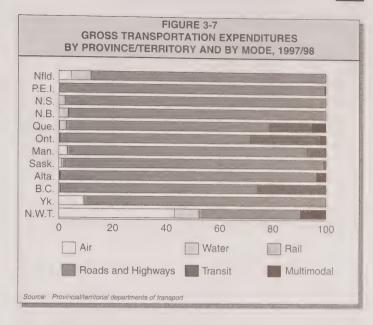
Tables 3-15 and 3-16 show transportation expenditures by mode and province/territory for 1991/92 and 1997/98 respectively.

#### **Expenditure Variances Among** Provinces/Territories

Spending on roads and highways accounts for the majority of provincial/territorial expenditures on transportation, although other modes are important for some provinces. The percentage of transportation budgets spent on roads and highways ranged from almost 100 per cent in Prince Edward Island to 38 per cent in the Northwest Territories.

Transit spending is important for Quebec, where it accounts for 16 per cent of the transportation budget, and in Ontario and British Columbia, where it accounts for 26 per cent in each province.

Remoteness makes spending on air transportation important in the



territories: it accounts for 43 per cent of transportation expenditures in the Northwest Territories, and nine per cent in the Yukon Territory.

Spending on water transportation accounted for seven per cent of transportation spending in Newfoundland and nine per cent in the Northwest Territories. There was also spending on water transportation in Nova Scotia, New Brunswick, Quebec and British Columbia.

Figure 3-7 shows the relative importance of gross transportation expenditures by mode in each jurisdiction, in 1997/98.

#### LOCAL GOVERNMENT EXPENDITURES ON TRANSPORTATION

In 1997, gross transportation expenditures by Canadian municipalities amounted to \$8 billion, declining for the second consecutive year after having peaked in 1995. Net expenditures

(i.e. gross minus transfer payments) were \$6.7 billion, continuing their increase as federal and provincial transfers declined. Transportation spending accounted for approximately 20 per cent of total municipal expenditures, a level essentially unchanged since 1991.

Expenditures on roads and streets in 1997 were \$6.3 billion, down 1.8 per cent from 1996, while expenditures on transit were \$1.6 billion, up 1.5 per cent from the previous year. Spending on roads and streets accounted for approximately 78 per cent of total gross expenditures on transportation. Spending on other transport areas, including wharves and airports, dropped to \$109 million.

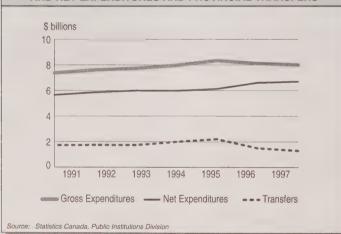
Table 3-17 shows local government expenditures on transportation from 1991 to 1997.

TABLE 3-17
LOCAL GOVERNMENT EXPENDITURES ON TRANSPORTATION

		(Million	s of dolla	rs)			
	1991	1992	1993	1994	1995	1996	1997
Gross Expenditures	7,365	7,604	7,728	7,971	8,337	8,114	8,001
Roads and Streets	5,967	5,950	6,084	6,334	6,623	6,375	6,256
Public Transit	1,297	1,558	1,534	1,535	1,580	1,613	1,636
Other Transportation	101	96	110	102	134	126	109
Less Transfers	(1,715)	(1,742)	(1,734)	(1,989)	(2,206)	(1,506)	(1,299)
Provincial	1,695	1,715	1,708	1,904	2,040	1,375	1,195
Federal	20	27	26	85	166	131	104
Net Expenditures	5,650	5,862	5,994	5,982	6,131	6,608	6,702
<b>Gross Transportation</b>	Expendi	tures as	% of Tota	I Local G	overnme	nt Expen	ditures
	20.1%	19.8%	19.7%	20.0%	20.2%	20.7%	20.4%
Source: Statistics Canada I	Qualia Inatite	rtiono Divinio	0.0				

Source: Statistics Canada, Public Institutions Division

# FIGURE 3-8 LOCAL GOVERNMENT TRANSPORTATION GROSS AND NET EXPENDITURES AND PROVINCIAL TRANSFERS



#### Provincial/Federal Transfers to Local Governments

In 1997, local governments received \$1.2 billion in transfers for transportation from the provinces, representing 92 per cent of total federal/provincial transportation transfers to municipalities. These transportation transfers to municipalities, in turn, represented 18 per cent of all transfers received by local governments — 16 per cent of provincial transfers and 23 per cent of federal transfers.

Compared with the 1991 net transportation budget, the cumulative increase to 1997 amounts to some \$3.4 billion compared with cumulative drops of \$3.3 and \$2.8 billion for the federal and provincial/territorial governments, respectively.

From 1995 to 1997, transportation transfers to local governments fell \$900 million, or 41 per cent. Transfers covered 16 per cent of gross transportation expenditures by municipalities in 1997, compared with 25 per cent in 1995. The decline is primarily attributable to the phasing out of the Canada Infrastructure Works Program, in which costs were shared equally between provincial, federal and local governments.

Figure 3-8 compares the evolution of municipal expenditures with transfers received from 1991 to 1997.



# TRANSPORTATION AND SUSTAINABILITY

Transportation is confronted with the challenges of overcoming the country's size and landscape - i.e. taking people and goods where they have to go, safely, swiftly and efficiently. These challenges involve helping Canada's economy to remain competitive, making the appropriate decisions about the future of Canadian transportation as well as working toward sustainability in the transport sector. In air, surface and marine transportation, steps have been taken to modernize transportation in Canada, moving toward greater efficiency, fewer subsidies and greater say for those who use the system. The objective of a safe, secure and accessible transportation system - in which all modes compete through market forces - and the objective of protecting the physical environment, together, are shaping sustainable transportation. This part of the report reviews a number of matters of importance to sustainable transportation: first, safety, environment and energy; then a review of the role of transportation in regional economies, employment, trade and tourism; and, finally, an overview of the impact of information and communication technology on transportation.

# TRANSPORTATION AND SUSTAINABILITY PART B

# TRANSPORTATION AND SAFETY

Canada's transportation system safety record improved in 1998, despite some well-covered tragic accidents.

The safety and security of Canada's transportation system continues to be a top priority for the federal government. This commitment is reflected in all of Transport Canada's activities.

The department's focus is on developing practical safety programs and effective regulations, and ensuring that these regulations are followed. In particular, the department regulates, monitors and evaluates safety-related issues in the following areas: aeronautics and airports; air and marine navigation; marine shipping facilities; commercial shipping; new motor vehicle standards; extra-provincial commercial motor vehicles and railways and canals connecting

provinces with each other or with the United States.

Responsibility for transportation safety in Canada involves many stakeholders, including the federal, provincial, territorial and municipal governments; industry; and non-governmental organizations. Transport Canada works closely with industry and other federal government departments, such as the Transportation Safety Board, to maintain nationwide safety.

This chapter describes several areas of transportation safety, such as, transportation occurrence statistics for all modes, including international comparisons; transportation of dangerous goods initiatives; and federal, provincial and municipal government safety initiatives, as well as international contributions to safety.

# TRANSPORTATION OCCURRENCES

In general, 1998 was a year of mixed success. It was marked with some tragic and high-profile occurrences, ranging from the sinking of the Cypriot bulk carrier, *MV Flare*, in January 1998 with 21 fatalities, to the crash of Swissair Flight 111 with 229 fatalities. This crash was the single worst aviation accident in the world in 1998. Although it happened on Canadian

# TABLE 4-1 TRANSPORTATION OCCURRENCES BY MODE 1998 vs. FIVE-YEAR AVERAGE

	Aviation	Marine	Rail	Road*
Accidents				
Most Recent Year	384	487	1,081	635,412
Five Year Average	378	668	1,188	682,287
Fatalities				
Most Recent Year	83	47	100	3,064
Five Year Average	87	33	114	3,361
Incidents				
Most Recent Year	778	158	439	N/A
Five Year Average	641	186	443	N/A

Road accidents are for 1996 (the most recent statistics available) and for the 1991 - 1995 period; road fatalities are for 1997; and all other modes are for the 1993-1997 period.

Source: Transportation Safety Board

# TABLE 4-2 ACCIDENT RATES IN TRANSPORTATION 1998 vs. FIVE-YEAR AVERAGE

	Accident Rate								
	Aviation	Marine	Rail	Road*					
Most Recent Year	9.6	4.3	14.2	N/A					
Five Year Average	10.0	4.5	15.2	N/A					

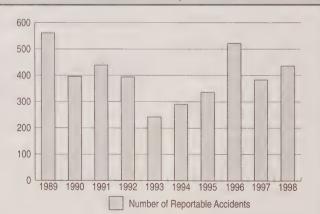
Road accidents are for 1996 (the most recent statistics available) and for the 1991 - 1995 period; road fatalities are for 1997; and all other modes are for the 1993-1997 period.
 Aviation: Canadian registered aircraft only. (Per 100,000 hours flown.)

Marine: Canadian - flag vessels only, commercial accident rate. (Per 1,000 commercial vessel trips).

Rall: Includes all railways in Canada operating under Federal jurisdiction. (Per million train-miles).

Source: Transportation Safety Board

FIGURE 4-1
REPORTABLE ACCIDENTS INVOLVING
DANGEROUS GOODS, 1989 – 1998



Note: For 1993 and 1994 the apparent drop is mostly due to a change in processing of information; the figures for 1998 are only estimates.

Source: Transport Canada, Dangerous Goods Accident Information System

territory, it will not appear in Canada's transportation system safety record because the aircraft was not Canadian-registered or operated by a Canadian carrier.

Despite these tragic accidents, Canada's overall safety record continued to improve in 1998. The number of accidents in the marine, rail and road modes declined from both the previous year and their respective five-year averages. In the case of air, the number of accidents involving Canadianregistered aircraft was up from 1997 levels, the accident total was in line with the five-year average.

Table 4-1 compares transportation occurrences by mode with the five-year average.

These comparisons can be misleading as they do not take into account the specifics of each mode, nor do they reflect the level of activity or exposure to risk associated with each particular mode.

The number of road accidents in 1996 was approximately seven per cent lower than the average of the previous five years, while the number of road fatalities in 1997 was almost nine per cent lower than the five-year average.

Aviation and marine fatalities rose in 1998 as a result of a few tragic accidents but declined in the rail mode. While aviation fatalities were up, the number of fatal aviation accidents in 1998 fell significantly to 31 from the 1997 level of 36 and the comparable five-year average (43).

The accident rate, which takes into account the level of activity in each mode, also shows a general downward trend in 1998. The levels of activity suggest the accident rates in the marine, rail and aviation modes were below the

corresponding averages for the previous five years. In aviation, for example, the accident rate per 100,000 flying hours, while up slightly from 1997, was well below the five-year average, and significantly below that of the past 10 years.

Table 4-2 presents accident rates by mode for the most recent year and the five-year average.

Marine accident rates indicate a continuing downward trend, with shipping accidents involving Canadian commercial vessels per 1,000 trips down to 4.3 in 1998 from 4.5 for the 1993-1997 five year average. This is attributed, in part, to a continuing decrease in marine activity. For rail, the 1998 rate fell to 14.2 accidents per million train-miles, down from the 1993-1997 average of 15.2 accidents.

Figure 4-1 shows the number of transportation of dangerous goods reportable accidents for the period 1989 to 1998.

#### RAIL

#### **Domestic Operations**

Prior to August 1992, railway occurrences such as main-track derailments, non main-track collisions and derailments, and crossing accidents had a different reporting criteria. This is a contributing factor to the increase in rail occurrences after 1992 as illustrated in Table 4-3.

The statistics presented in this section include all railways under federal jurisdiction. In 1998, a total of 1,081 railway accidents were reported, down four per cent from 1997 levels and nine per cent below the annual average between 1993 and 1997. This represents an accident rate of 14.2 accidents per million train-miles, on an

TABLE 4-3
ACCIDENTS IN RAIL TRANSPORTATION
1989 - 1998

	Number of	Accidents	Accident	Rate*	
	Pre-TSB	Post-TSB	Pre-TSB	Post-TSB	
Year	Criteria	Criteria	Criteria	Criteria	Fatalities
1989		927		12.4	142
1990		903		13.2	103
1991		990		13.3	124
1992	932	969	12.5	13.0	137
1993	868	1,025	11.4	13.4	116
1994	926	1,212	11.2	14.7	112
1995	906	1,276	11.6	16.4	120
1996	1,004	1,305	13.3	17.3	117
1997	828	1,121	10.6	14.3	107
1998	688	1,081	9.0	14.2	100
1993-1997					
Average	906	1188	11.6	15.2	114

\* Number of accidents per million train-miles. Source: Transportation Safety Board

estimated base of 76.3 million train-miles. This rate was consistent with that of 1997, and lower than the annual average rate of 15.2 between 1993 and 1997.

Of total rail-related accidents reported in 1998, non main-track derailments and collisions accounted for 46 per cent; crossing accidents 26 per cent, and maintrack derailments ten per cent.

Table 4-3 provides a summary of rail accidents for the period 1989 – 1998.

There were 100 rail fatalities in 1998 – the lowest number of fatalities for the 10-year reference period, and less than the 5-year average of 114. Historically, most rail fatalities result from accidents at crossings or accidents involving trespassers. As these two areas are of particular concern to the federal government, it has initiated several programs to address these issues.

Railway crossing accidents by province from 1989 to 1998 are presented in Table 4-4.

The 277 total crossing accidents reported in 1998 represent the lowest number of accidents since 1989, down 10 per cent from 1997 and 24 per cent below the five-year average. Accidents at automated protected crossings remained constant at 48 per cent.

Fatal crossing accidents, as a proportion of total accidents, increased to 15 per cent in 1998, up from the five-year average of 10 per cent. Crossing accidents involving passenger trains, however, have remained relatively constant for the last two years and are down 15 per cent over the last five years.

Table 4-5 summarizes the number of rail trespasser accidents by province.

The 80 accidents involving rail trespassers in 1998 represents a decline of 18 per cent from 1997. Compared with the previous 5-year average, these accidents have declined by one-quarter. Ontario accounted for 44 per cent of all trespasser accidents. Fatal accidents made up 69 per cent of total trespasser accidents, a

TABLE 4-4 CROSSING ACCIDENTS BY PROVINCE 1989 – 1998										
Province	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Accidents * Newfoundland / Prince Edward										
Island / Nova Scotia (167)	8	9	3	14	10	6	5	8	5	3
New Brunswick (316)	14	8	7	16	14	12	12	6	5	2
Quebec (2,478)	105	59	62	61	58	78	58	61	49	48
Ontario (5,229)	136	138	132	135	117	107	122	92	75	67
Manitoba (3,038)	45	24	44	28	34	29	33	46	31	33
Saskatchewan (6,437)	41	52	56	53	36	42	44	49	32	39
Alberta (3,705)	78	60	64	49	65	71	66	71	70	56
British Columbia (1,039)	42	36	39	30	45	45	40	33	40	29
Canada (22,424)	469	386	407	386	379	390	380	366	307	277
Crossing Fatal Accidents Passenger Train	69	43	52	55	40	45	39	40	28	41
Related Accidents	64	29	37	43	38	37	26	40	28	29

<sup>\*</sup> Figures in brackets denote estimated number of public crossings in each province as of January 1999. The Canadian total includes the Northwest Territories. Source: Transportation Safety Board

TABLE 4-5 RAIL TRESPASSER ACCIDENTS BY PROVINCE 1989 – 1998										
Province	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Accidents Newfoundland / Prince Edward										
Island / Nova Scotia	2	3	1	1	3	1	1	4	0	2
New Brunswick	3	1	0	0	4	0	6	3	0	0
Quebec	9	9	12	20	19	27	27	32	16	14
Ontario	30	27	51	44	45	40	40	54	47	35
Manitoba	4	5	0	3	3	7	13	1	4	5
Saskatchewan	7	5	4	3	8	3	3	3	4	2
Alberta	13	17	9	13	6	12	13	9	7	9
British Columbia	19	16	16	14	15	9	9	22	20	13
Canada	87	83	93	98	103	99	112	128	98	80
Trespasser Fatal Accidents Passenger Train	45	48	56	55	56	54	63	66	68	55
Related Accidents	18	17	19	26	25	20	23	28	25	27
Source: Transportation Safety Board										

decrease of 10 per cent from the 1993 to 1997 average. Passenger trains were involved in one-third of the 1998 accidents, up from the 1997 level.

In order to improve the level of rail safety in Canada, the program Direction 2006 addresses specifically these crossing and trespasser types of accidents, with the goal to reduce grade crossing accidents and trespasser fatalities by 50 per cent by the year 2006. Public awareness and education programs, monitoring and enforcement, safety programs and research will be the focus.

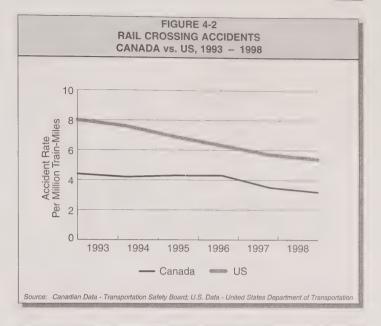
#### **International Comparisons**

Figure 4-2 provides a comparison of crossing accidents in Canada and the US between 1993 and 1998.

Both countries have been able to reduce the rate of rail crossing accidents. The accident rate in Canada, while relatively stable for the initial three years of the reference period, has declined since 1996. Over the same period, the rate in the US has also shown a steady decline. On average, Canada's railway crossing accident rate per million train-miles has been 20 per cent lower than that of the US.

Figure 4-3 shows crossing and trespasser fatalities.

These fatalities account for most of the rail-related fatalities in Canada. While the fatality rate has remained relatively constant over the last two years, fatalities declined in 1998.



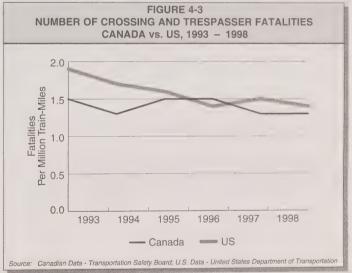


TABLE 4-6 TOTAL ROAD CASUALTY COLLISIONS AND PERSONS INJURED OR KILLED, 1992 - 1996 Persons Persons Casualty Injured Year Collisions Kilies 3 500 249.821 172,713 1992 247 582 3.614 1993 171.205 244.975 169.502 3.260 1994 241.800 3.347 1995 166.950 158.973 3 082 230.885 1996 221.186 3.064 1997 152.689 243.013 167.869 3.361 92 - 96 Avg.

-8.8

-0.6

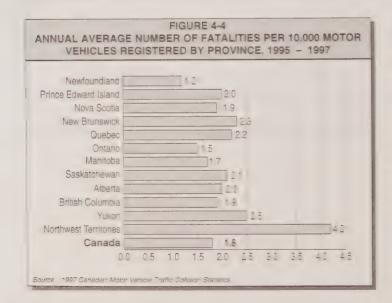
Source: 1997 Canadian Motor Vehicle Traffic Collision Statistics

-40

% Cha. 97/Ava.

% Chg. 97/96

TABLE 4-7 ROAD FATALITIES BY CATEGORIES OF ROAD USERS 1992 - 1997										
Year	Drivers	Passengers	Peaestrians	Bievolists	Motorcyclists	Other				
1992	1752	969	444	-5	186	74				
1993	1806	962	479	81	213	73				
1994	1646	860	427	85	163	79				
1995	1674	936	415	54	165	93				
1996	1534	833	462	59	128	66				
1997	1569	822	403	ê <sup>-</sup>	120	83				
92-'96 Avg.	1682	912	445	73	171	77				
Source. 1997 Car	nadian Motor	Vehicle Traffic Coll	lision Statistics							



#### ROAD

-9 0

-4.2

The most recent annual data on Motor Vehicle is 1997 for fatalities, injuries and casualty collisions and 1996 for property damage only PDO collisions.

#### **Domestic Operations**

Canada's road safety record has been steadily improving over the last several years. In 1997, there were 3.064 fatalities from motor vehicle accidents, the lowest total in 41 years (statistics have been recorded since 1945). The number of road-related fatalities was down 0.6 per cent from 1996 and down 2.1 per cent from the annual average between 1992 and 1996.

Table 4-6 illustrates the total number of road-related casualty collisions, fatalities and injuries.

Casualty collisions include both fatalities and injuries. There has also been a general downward trend in casualty collisions, with numbers down four per cent from 1996, and nine per cent from the annual average between 1992 and 1996. Fatalities also declined in 1997 to 0.6 per cent below the 1996 figure and nine per cent below the average between 1992 and 1996 annual average.

Table 4-7 shows road fatalities classified by six major categories of road users.

Virtually all categories contributed to an overall downward trend in fatalities between 1992 and 1997. Drivers are the single largest category of road fatalities. In 1997, they made up 51.2 per cent of total road fatalities, while pedestrians accounted for 13.2 per cent.

Road fatality rates by province are presented in Figure 4-4.

The highest fatality rates over the three-year period from 1995 to 1997 were in the Northwest Territories and the Yukon reflecting the low number of vehicles registered and the more difficult highway conditions. Newfoundland and Ontario had the lowest fatality rates during this

Figure 4-5 shows the percentage of road collisions and fatalities involving commercial vehicles.

From 1989 to 1996, collisions involving commercial vehicles accounted for eight per cent of all road collisions and roughly 18.2 per cent of road fatalities.

Table 4-8 provides a breakdown of commercial and other vehicles involved in fatal collisions by type of vehicle.

Statistics on fatal motor vehicle collisions by type of vehicle are presented in Table 4-9.

In 1996, the private automobile accounted for 55 per cent of the total fatal collisions by vehicle. This share is down slightly from 1992, when the automobile accounted for 58 per cent. Light duty trucks and vans had the second largest share of fatal collisions by vehicle in 1996. with 24 per cent.

#### **International Comparisons**

As a result of its successes in improving motor vehicle safety. Canada ranks as one of the top Organization for Economic Co-operation and Development (OECD) countries.

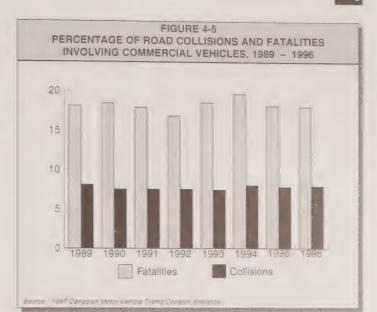


TABLE 4-8 COMMERCIAL VEHICLES AND OTHER VEHICLES\* INVOLVED IN FATAL TRAFFIC COLLISIONS BY VEHICLE TYPE 1992 - 1996

Vehicle Type	1992	1993	1994	1998	1998
Commercial					
Bus	46	37	43	31	39
Trucks >=4,536 kgs.	184	212	197	163	167
Tractor-Trailers	295	343	328	346	294
Total Commercial Vehicles	525	592	568	540	500
Other Vehicles Involved with Commercial Vehicles	507	599	574	533	458
Total Vehicles Involved in Collisions Involving Commercial Vehicles	1032	1191	1142	1073	958
0011111010101	1002				
All Other Vehicles Involved in Collisions	3862	3933	3590	3606	3438
Total All Vehicles	4894	5124	4732	4679	4396

Table shows the number of commercial vehicles and other vehicle nyaying a commercial van die las well as other vehicles involled it it all to list uits

Source in 991 Canadien Motor venicle Tranic Collego State to

	TABLE 4-9 VEHICLES INVOLVED IN FATAL COLLISIONS BY VEHICLE TYPE 1992 – 1996										
Vehicle Type	1992	1993	1994	1995	1996						
Automobile	2819	2866	2605	2583	2431						
Light Duty Trucks and Vans Truck:	1026	1147	1083	1077	1037						
Tractor Trailer	295	343	328	346	294						
Truck >4536 kgs.	184	212	197	163	167						
Other ·	27	23	23	25	15						
Bus											
School	21	12	16	10	12						
Intercity	4	1	7	5	7						
Transit	12	10	11	6	7						
Bus Unspecified	9	14	9	10	13						
Motorcycle*	189	217	164	170	141						
Bicycle	87	85	91	70	63						
Farm Equipment	39	31	32	36	37						
Snow Equipment	44	56	39	64	50						
Train / Streetcar	26	19	20	11	16						
Motorhome	. 28	18	32	24	28						
ATV	9	10	13	4	8						
Other	75	60	62	75	70						
Total	4894	5124	4732	4679	4396						
* Motorcycle includes moded											
Source Transport Canada Road Saren											

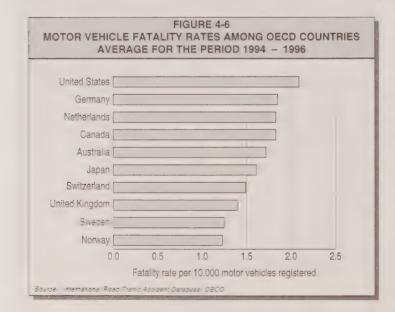


Figure 4-6 compares the fatality rates per 10,000 motor vehicles registered among some member countries of the OECD between 1994 and 1996.

Vehicle ownership rates are considered to be an indicator of motor vehicle activity and exposure to risk. Canada's vehicle ownership rate was 57.5 per 100 inhabitants in 1996, compared with the US, which has the highest among OECD countries with 76. Higher ownership rates in Canada and in the US indicate a greater degree of reliance on this mode of transportation and a higher exposure to risk for travellers.

#### MARINE

#### **Domestic Operations**

The marine industry reported a total of 546 marine accidents in 1998 – a 23-year low. Shipping accidents were down to 487 or nine per cent below the 1997 level and approximately 27 per cent less than the average between 1993 and 1997. On average, shipping accidents have declined by nine per cent per year since 1990. In addition to shipping accidents, there were 59 accidents aboard ship, a figure consistent with recent years.

The most common type of shipping accident was groundings with 127 or 26 per cent of the year's total. Strikings were the second most frequent type of accident, accounting for 17 per cent. Virtually all types of accidents declined in 1998. The one exception was collisions which represented three per cent of total accidents

There were 530 vessels involved in shipping accidents during the year, an 8 per cent decrease from 1997 levels and a 28 per cent reduction over the five-year average. Fishing vessels represented the largest portion of vessels involved in shipping accidents, accounting for 48 per cent of the total, down from 56 per cent the previous year. The number of accidents involving the commercial category increased with the exception of barges. Ferry and passenger vessels involved in accidents, for example, increased from 30 to 45, while the number of tanker accidents was up to 18 from 13 in 1997. The 1998 accident level, in both cases, was comparable to their respective five-year averages.

Non-fishing vessels involved in shipping accidents rose to 198 in 1998 from 176 in 1997.

Conversely, the number of fishing vessels involved in accidents fell to 245 from 309 in 1997.

Accidents involving foreign-flag vessels in Canadian waters totalled 87 in 1998 compared with 90 the previous year. Of this total, the vast majority — 91 per cent — were non-fishing vessels.

There were 46 vessels lost in 1998, a figure substantially below the 1997 total of 60 and the five-year average of 76. The Western Region alone reported half of these losses. Small fishing vessels accounted for the largest proportion of vessels lost in Canada, 40 in 1998.

The number of marine-related fatalities increased to 47 in 1998 from 24 in 1997. This increase can be attributed, in large part, to the 21 lives lost on the Cypriotregistered MV FLARE off Canada's east coast. Of the total fatalities in 1998, 38 were the result of shipping accidents, while the remainder were the result of accidents aboard ship.

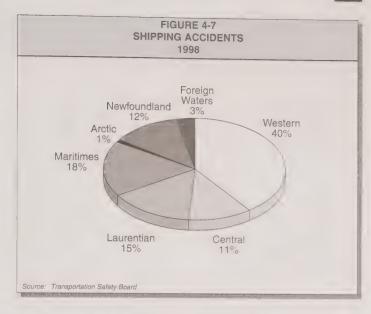


TABLE 4-10 MARINE OCCURRENCES 1989 – 1998							
Year	Shipping Accidents	Accidents Aboard Ship	Fatalities	Incidents	Injuries		
1989	1013	96	90	207	148		
1990	1056	69	57	180	118		
1991	904	46	42	183	56		
1992	840	69	29	205	137		
1993	710	67	35	218	102		
1994	797	67	40	228	81		
1995	695	56	39	199	82		
1996	605	58	25	124	71		
1997	533	58	24	155	82		
1998	487	59	47	158	70		
1993-1997 Average		61	33	186	84		
Source: Transportation Safety Board, as of Jan. 11, 1999							

The 158 shipping incidents in 1998 were consistent with 1997 levels yet down 15 per cent from the five-year average. The most common incidents reported were related to engine, rudder or propeller problems. The greatest reduction in recent years has been in the number of close-quarters situations reported, occurrences where the vessel is involved in a risk of collision, represented

23 per cent of the total in 1998, well below the five-year average of 32 per cent.

Marine occurrences from 1989 to 1998 are summarized in Table 4-10.

The decline in marine accidents is in line with an estimated decline in overall shipping activity in Canada, particularly with respect to fishing. Activity by vessel type

**TABLE 4-11 ACCIDENTS INVOLVING CANADIAN-REGISTERED AIRCRAFT** 1989 - 1998 1995 1996 1997 1998 1993 1994 Type of Aircraft 1989 1990 1991 1992 Aeroplanes Involved Airliners 11 3 11 7 15 6 7 6 9 15 7 8 13 9 10 9 15 14 9 Commuter Aircraft 129 113 138 108 119 138 Air Taxi/Aerial Work 164 149 137 118 155 153 153 154 Private/State 225 250 223 240 174 34 52 63 68 56 56 56 59 70 64 Helicopters Involved 17 21 12 12 10 16 8 Other Aircraft\* 19 14 14 384 498 453 435 422 380 390 342 356 Total 482 **FATAL ACCIDENTS** Aeroplanes Involved 5 0 3 0 3 0 1 1 0 Airliners 0 3 1 Commuter Aircraft 1 2 1 1 1 1 9 17 9 16 12 22 12 10 Air Taxi/Aerial Work 10 13 35 21 35 29 26 15 20 20 18 14 Private/State 6 7 8 Helicopters Involved 8 8 7 3 3 3 11 0 2 2 0 0 3 0 Other Aircraft\* 1 3 4

64

47

48

33

\*Other Aircraft include gliders, balloons and gyrocopters.

60 The number of aircraft involved may not sum to the number of accidents as some accidents involve multiple aircraft.

47

Source: Transportation Safety Board

Total

indicates an estimated decline of nine per cent in the number of fishing-vessel trips (vessels greater than 15 gross registered tonnes) in 1998 over 1997. Commercial vessel activity is estimated to have declined by six per cent in 1998.

#### Regional Overview

Canada is divided into six marine accident reporting regions. Accidents occurring in foreign waters involving Canadian vessels are also captured as part of the regular statistical occurrence reporting (Figure 4-7).

Typically, the Western Region has reported the largest portion of shipping accidents. In 1998, the region had 40 per cent of total accidents or 194. This is up slightly from the 183 accidents in 1997, but well below the region's five-year average of 240. Fishing vessels made up 66 per cent of the total number of vessels involved (211).

The Maritime Region reported 86 accidents, a decrease from 107 in 1997. Of the 94 vessels involved, 60 were fishing vessels. The Newfoundland Region showed the largest single decrease in the number of shipping accidents in 1998, reporting 59, well below the 105 of the previous year. The decrease is largely due to the drop in the number of fishing vessels involved in accidents to 49 from 84 in 1997.

Shipping accidents in the Laurentian Region were up to 72 in 1998 from 64 in 1997. Of the 81 vessels involved, 46 were in the cargo, oil / bulk / ore carrier (OBO), or tanker category. There were 56 accidents in the Central Region, unchanged from the previous year, but down dramatically from the five-year average of 76. Accidents in the Arctic (4) remained virtually unchanged from the previous year.

#### Port State Control

52

43

36

31

In Canada, there were 1,186 inspections carried out in 1998 under the two Memoranda of Understanding1 (MOU) on Port State Control, to which Canada is a signatory. The Port State Control initiative enables Transport Canada to inspect foreign ships entering Canadian ports to determine compliance with international maritime conventions for enhancing the safety of life at sea and protecting the marine environment.

Vessels from 65 different flags of registry were inspected in 1998. Almost half or 581 were found to have defects, with 25 per cent serious enough to require the vessels to be detained. The majority of vessels inspected were bulk carriers, accounting for 43 per cent of the total. Of those, 20 per cent were detained. The

The Paris MOU requires signatories (countries in the European region) to inspect 25 per cent of the vessels entering their ports. Tokyo MOU members (countries in the Asia-Pacific region) are working toward an inspection rate of 50 per cent of vessels entering their ports.

1991 23 83 100	1992 24 89 104	1993 23 76	1994 23 70	1995 22 78	1996 18 39	1997 21 62	1998
83	89	76		22	18	21	
83	89	76					
100	89	76					
	104		, 0				
		119	84	74	72	84	107
142	113	108	109	130	122	108	132
93	93	88	82	72	83	72	69
12	12	8	12	14	8	12	17
453	435	422	380	390	342	356	384
d	12 <b>453</b>	12 12 453 435	12 12 8 453 435 422	12 12 8 12 453 435 422 380	12 12 8 12 14	12 12 8 12 14 8 453 435 422 380 390 342	12 12 8 12 14 8 12 453 435 422 380 390 342 356

largest number of vessels detained by country flag were of Cypriot registry. Of the 91 Cypriot vessels inspected, 27 were detained, representing 19 per cent of the total number of vessels detained.

#### **Recreational Boating**

Drownings from recreational boating in 1996 - the most current year for which data is available - totalled 156. This figure is comparable to the 1995 total of 153, and slightly above the average of 146 between 1991 and 1995. The largest proportion of drownings were associated with fishing, which accounted for 33 per cent, followed by power boating with 19 per cent. Drownings by type of boat indicate that small open powerboats and canoes had the greatest numbers with 29 per cent and 24 per cent, respectively. Ontario reported the largest percentage of drownings with 32 per cent, followed by Quebec with 21 per cent.

There were 20 non-drowning boating fatalities in 1996, compared with 15 in 1995. Of these, 14 involved collision or trauma and 6 were the result of immersion hypothermia. Half of the fatalities for both these accident types occurred in British Columbia.

#### AVIATION

#### **Domestic Operations**

The following section deals with transportation occurrences involving Canadian-registered aircraft. It does not extend to occurrences involving foreign aircraft, accidents involving ultralight or advanced ultra-light aircraft.

In 1998, there were 384 accidents involving Canadianregistered aircraft. While this represents an eight per cent increase over 1997, it is only above by 1.6 per cent over the average between 1993 and 1997.

Table 4-11 shows the number of accidents and fatal accidents by type of aircraft from 1989 to 1998.

Over this 10-year period, accidents for most aircraft types declined significantly, most notably in the private/state category. Nevertheless, this category still had the largest portion of accidents involving Canadian-registered aircraft. In 1998, accidents involving private operators accounted for 40 per cent of the total number of accidents, virtually unchanged from 42 per cent in 1997. The private/state category accounted for a 45 per cent share of all fatal

accidents in 1998, although the number of such accidents (14) was less than one-half the level it held ten years earlier (35).

Airliners include commercial aircraft that have a maximum takeoff weight of greater than 8,618 kilograms, or that are authorized to carry more than 20 passengers. In 1998, airliners were involved in 15 accidents, up from an average of 8 between 1993 and 1997. None of these accidents resulted in fatalities, and all were relatively minor in nature. Regional or larger commuter aircraft are those having a maximum take-off weight of less than 8,618 kilograms or having from 10 to 19 seats. Accidents involving these aircraft were well below 1997 levels and the five-year average. There were no fatal accidents involving airliner operations in 1998, while there was one involving a commuter aircraft (fatal accident at Mirabel).

Most commercial accidents involve the air taxi or aerial work category. In 1998, of the 162 commercial aviation accidents, 138 or 85 per cent, involved the air taxi or aerial work category. This represents a jump of 19 per cent from 1997, and is approximately 16 per cent higher than the five-year average. The

TABLE 4-13 FATALITIES INVOLVING CANADIAN-REGISTERED AIRCRAFT BY REGION 1989 – 1998										
Transport Canada Region	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Atlantic	2	0	5	0	2	2	6	6	2	5
Quebec	25	21	17	8	22	20	9	12	18	27
Ontario	48	21	12	16	23	16	31	12	10	9
Prairie & Northern	21	12	32	17	25	11	26	12	17	20
Pacific	39	25	29	32	25	23	32	20	22	12
Outside Canada	20	12	278	7	5	8	3	8	8	10
Total	155	91	373	80	102	80	107	70	77	83
Source: Transportation Safety Board										

flight training, test/demonstration and aerial application categories also registered significant yearover-year increases.

#### **Regional Overview**

Table 4-12 summarizes air accidents by region between 1989 and 1998.

While the number of air accidents rose in 1998, there has been a downward trend in all regions over the 10-year period. In 1998, the Prairie and Northern region accounted for more than one-third or 34 per cent of all accidents involving Canadianregistered aircraft, followed by Ontario with 28 per cent, and the Pacific with 18 per cent. The largest single year-over-year (1998 - 1997) increases occurred in the Ontario and Prairie / Northern regions. Accidents in the Ouebec region in 1998 were down significantly (31 per cent).

Table 4-13 shows air fatalities by region from 1989 to 1998.

Although air fatalities were up eight per cent in 1998, compared with the previous five-year average, they were down (almost five per cent). The Quebec region had the highest number of fatalities in 1998, with 27, followed by the Prairie and

Northern region with 20 and the Pacific with 12. The high number of fatalities in the Quebec region was largely attributable to two major accidents, one at Mirabel and the other at Baie Comeau.

Some of the fatal accidents involved smaller commercial aircraft such as air taxi or aerial work operations. Air taxi / aerial work category includes those aircraft used by a Canadian operator for an on-hire basis that does neither an airliner or air commuter aircraft. It includes such specialty services as aerial photography, and aerial application.

Serious injuries resulting from accidents were also down from 1997 and remained below the five-year average.

In 1998, the number of reported incidents involving either Canadian or foreign-registered aircraft increased by 13 per cent over 1997 and by 21 per cent over the average between 1993 and 1997. Declared emergencies, engine failures and smoke or fire incidents were also up, while incidents involving loss of separation, collisions and risk of collision declined. Loss of separation refers to an occurrence in which less than the authorized minimum separation or distance

between two aircraft was not assured. The category includes collision (with terrain, with an object, with another aircraft, etc.) risk of collision as well as loss of separation.

The increase in incidents was due, in part, to an increase in the level of aviation activity in 1998 (up four per cent over 1997), and to the heightened sensitivity created from high-profile occurrences such as the Swissair accident. Transport Canada is conducting a detailed examination of smoke or fire incidents to determine whether any safety deficiencies exist.

#### **International Comparisons**

Table 4-14 provides a comparison of the proportion of fatal air accidents for Canada and the US. Over the period 1993 - 1998, the rates tended to be highly similar.

Comparing the safety records of the US and Canada is difficult both in terms of identifying the basis for comparison and having a consistent and appropriate level of detail. This is primarily due to the ways in which they classify and record their respective data and information, the fundamental differences of the two countries' air transport systems — Canada's

largely linear network and the US's hubbing system. Both countries are currently active members of an international panel and forums to establish a common taxonomy and systems for interpreting aviation related information.

In 1996, Transport Canada introduced a change in the classification system for commercial aircraft, moving away from the carrier level system associated with the size of the operator to one that classifies according to the primary purpose for which the aircraft is registered. The US also introduced its own changes, which took effect in March 1997. These changes reclassified aircraft carrying between 10 and 29 passengers. which had been previously classified under Part 135, to be included under Part 121. The immediate effect of this change was to drastically reduce the total number of hours flown in the Part 135 scheduled service category and increase the number of hours flown in the Part 121 scheduled services.

From a safety perspective, the US had a successful year. According to the preliminary US aviation accident statistics report for 1998, there were no passenger fatalities for American-registered scheduled airlines flying under both Part 121 and Part 135 (less than 10 seats. Although there have been years in which there were no fatalities under Part 121, there has never been a year in which there were no Part 135 fatalities.

# TRANSPORTATION OF DANGEROUS GOODS

Every year over 27 million dangerous goods shipments are transported across Canada. Most

# TABLE 4-14 PROPORTION OF FATAL AVIATION ACCIDENTS CANADA – US, 1993 – 1997

							1993-1997
	1993	1994	1995	1996	1997	1998	Average
Canada	0.0400	0.2000	0.0909	0.1538	0.0435	0.0417	0.1056
US	0.0435	0.1739	0.0833	0.1316	0.0816	0.0208	0.1028

Note: Figures pertain to Airliner and commuter aircraft only, CAR's definitions.
Aircraft with 10 or more seats.

Sources: Canada Transportation Safety Board; US National Transportation Safety Board

of these shipments include goods that directly influence and improve the lifestyle that Canadians have come to expect and enjoy. The Transport of Dangerous Goods (TDG) program promotes public safety during the transportation of goods that can threaten public safety when involved in an accidental release.

TDG accidents are called "reportable" if they meet the reporting requirements defined in TDG program regulations. Very few TDG accidents are caused by the dangerous goods themselves. In 1998, there was one reportable TDG accident directly caused by dangerous goods. No fatalities, injuries or damage to the environment resulted from this accident.

Table 4-15 compares reportable accidents involving dangerous goods by mode of transport.

In 1998, there were 436 reportable dangerous goods accidents. In-transit accidents in Table 4-15 include those that occurred during actual transport, while handling accidents are those that took place at facilities. Many handling accidents occur in warehouses while the goods are being handled prior to loading or unloading. Between 1988 and 1998, more reportable dangerous goods accidents occurred at the

handling stage than while they were being transported.

The number of deaths related to dangerous goods is low.

Table 4-16 summarizes the number of deaths, as well as the number and severity of injuries caused by the dangerous goods at reportable accidents.

Table 4-17 gives the total number of deaths and injuries which occurred at reportable transportation of dangerous goods accidents. In many cases, the deaths and injuries are caused by the accident itself (e.g. a collision), not by the goods.

In Tables 4-16 and 4-17, minor injuries refer to those injuries that require first-aid treatment, moderate injuries require emergency hospital treatment, and major injuries require overnight hospitalization.

TABLE 4-15
REPORTABLE ACCIDENTS INVOLVING DANGEROUS GOODS
BY MODE OF TRANSPORT, 1988 – 1998

		In Tr	ansit		Not in	
Year	Road	Rail	Air	*Marine	Transit	Total
1988	155	11	0	1	323	490
1989	192	29	3	3	334	561
1990	183	17	2	0	194	396
1991	155	27	4	2	251	439
1992	140	25	0	1	228	394
1993	103	25	1	0	113	242
1994	114	30	1	0	145	290
1995	109	19	3	0 .	205	336
1996	239	35	9	1	237	521
1997	166	16	6	1	194	383
Average	156	23	3	1	222	405
1998	184	14	4	0	234	436

<sup>\*</sup> The TDG program does not cover dangerous goods transported in bulk on ships or by pipeline.

Source: Transport Canada, Dangerous Goods Accident Information System

TABLE 4-16
DEATHS AND INJURIES CAUSED BY DANGEROUS GOODS
AT REPORTABLE ACCIDENTS, 1988 – 1998

	Deaths due to	***********	Injuries due to Dan	gerous Goods	
Year	Dangerous Goods	Major	Moderate	Minor	Totals
1988	6	-	-	-	65
1989	3	21	50	13	84
1990	0	8	42	0	50
1991	1	9	9	21	39
1992	0	3	3	34	40
1993	18¹	1	2	14	17
1994	0	0	3	29	32
1995	0	3	58 <sup>2</sup>	2	63
1996	1	2	10	16	28
1997	2	15	14	4	33
Average	3.1	6.9	21.2	14.8	45.1
1998	2	1	19	8	28

<sup>1</sup> All 18 deaths are from the same bus-truck collision, Lac Bouchette (Québec).

Source: Transport Canada, Dangerous Goods Accident Information System

# 1998 CONTRIBUTIONS TO TRANSPORTATION SAFETY

# FEDERAL SAFETY INITIATIVES

The following section provides an overview of federal transportation safety initiatives undertaken in all modes in 1998. These activities are primarily focused on safety inspection and monitoring of compliance with safety legislation and regulations; safety enforcement; research and development; and public safety awareness education programs.

While initiatives related to transportation infrastructure improvements, such as widening of roads, also contribute to safety, they are excluded in this report.

Provincial and municipal governments and non-governmental organizations, also play a key role in contributing to the safety of the transportation system. Given the prevailing trend toward partnerships and alternative service delivery, their role has become increasingly important. This report recognizes the important role these organizations play in transportation safety; however, it gives only an overview of provincial and municipal governments' safety initiatives and does not address contributions by industry and non-governmental organizations.

#### Rail

The Railway Safety Act gives the federal government authority to regulate rail safety. Through a regulatory framework, it gives railway companies greater flexibility to manage their operations safely and efficiently and provides for protection of

<sup>2</sup> Thirty one employees were exposed to a carbon disulphide release in Ottawa (Ontario).

public safety at railway crossings. The Act also covers the enforcement of regulations. standards and procedures for safe railway operations for interprovincial and cross-border railways, and specific intraprovincial rail lines.

Amendments to the Railway Safety Act were tabled in Parliament in November 1998, and are expected to be proclaimed in early 1999. The product of extensive consultations with stakeholders in the rail sector railway companies and provinces these amendments will allow Transport Canada to make more use of the overall safety management systems of railways and to audit them to ensure full compliance with regulations.

In addition, these amendments will enhance the department's compliance activities and ensure national consistency through a comprehensive railway safety monitoring program, which will replace the current inspection-based approach. The department is also reviewing operations, equipment and engineering programs to reflect proposed legislative and regulatory requirements, and safety performance standards.

In 1997/98, Transport Canada continued work on a number of safety initiatives, including increasing safety at railway crossings through more stringent visibility standards; reducing trespassing on railway tracks through a variety of measures, such as fencing and educational awareness activities; and enhancing passenger safety requirements on trains through onboard safety announcements. The department is also establishing a permanent consultative committee of departmental officials and rail safety stakeholders and developing

**TABLE 4-17** TOTAL DEATHS AND INJURIES AT REPORTABLE **DANGEROUS GOODS ACCIDENTS** 1988 - 1998

	Deaths		Injurie	S	
Year	All Causes	Major	Moderate	Minor	Totals
1988	20	-		-	109
1989	17	39	51	17	107
1990	15	21	70	15	106
1991	14	33	27	35	95
1992	8	16	15	47	78
1993	31¹	9	16	24	49
1994	13	8	20	34	62
1995	7	27	66²	13	106
1996	9	16	37	23	76
1997	15	50	73	11	134 <sup>3</sup>
Average	14.9	24.3	41.7	24.3	92.2
1998	12	34	39	11	84

- 20 deaths(2 not due to dangerous goods) resulted from one bus-truck collision, Lac Bouchette, Québec. 31 employees were exposed to a carbon disulphide release in Ottawa, Ontario.

3 27 passengers injured in one bus-truck collision in Fox Creek, Alberta Source: Transport Canada, Dangerous Goods Accident Information System

a national rail safety training program for railway safety inspectors.

The department rigorously monitored rail safety, reviewed industry safety performance data, and systematically identified and resolved railway safety issues during the year. The department's compliance monitoring activities also included ensuring safe construction and maintenance standards were met by railway companies, municipalities and land owners for railway equipment, grade crossings and right-of-way access control.

Transport Canada contributed approximately \$7.5 million in 1997/98 toward safety improvements at grade crossings, including the installation of automatic warning devices at railway grade crossings.

The Minister of Transport announced a \$250,000 contribution in 1998 to the Railway Association of Canada to support the rail safety program Direction 2006. Begun in 1995, this 10-year program is a partnership between all levels of government, law enforcement agencies, safety organizations, and railway companies and unions. The program's objective is to reduce grade crossing collisions and trespassing incidents by 50 per cent by 2006. The federal contribution to this program will support a variety of immediate activities that will help attain this goal.

In addition, the department also continued to support Operation Lifesaver, a joint education program with the Railway Association of Canada, to educate and promote public awareness of safety programs and the dangers of railway crossings and trespassing. The department contributes \$200,000 annually to this program.

#### Road

Transport Canada carries out federal responsibility for road

safety under the *Motor Vehicle*Safety Act by developing national standards for motor vehicle safety, fuel emissions, and enforcing these standards. In addition, the *Motor Vehicle Transport Act* gives the department responsibility for regulating the safe operation of extra-provincial motor carriers. The department maintains a national oversight role while delegating implementation responsibilities to the provinces and territories.

Federal programs to improve overall road safety are focused on regulatory standards development and compliance, public awareness and education, research and accident investigation. Transport Canada will continue to play a leadership role in supporting Road Safety Vision 2001, a comprehensive road safety program developed to make Canada's roads the safest in the world.

Launched in 1997, Road Safety Vision 2001 commits federal. provincial and territorial governments, through the Canadian Council of Motor Transport Administrators (CCMTA) to work on a number of safety priorities to help Canada achieve the best road safety record among industrialized countries. These priorities include: raising public awareness of road safety issues; improving communication, coordination and collaboration among road safety agencies; developing more efficient enforcement to deal with problem areas, such as impaired driving, repeat offenders and high-risk drivers; and improving the collection and quality of data to ensure road-safety programs are practical and cost effective.

Transport Canada is taking the lead to coordinate this initiative and is also participating in several

program-specific initiatives with the provinces, industry and other stakeholders.

Improving and broadening the level of protection afforded to all vehicle occupants by air bag systems remains a high priority for Transport Canada. As part of the effort, Transport Canada and the U.S. National Highway Traffic Safety Administration initiated a major co-operative research program to develop testing procedures to promote the development of advanced air bag technology. Priority is currently being given to children and people of small stature to ensure their protection requirements are addressed in safety regulations.

The department is also continuing to ensure that vehicles comply with applicable Canada Motor Vehicle Safety Standards and that manufacturers and importers take the proper remedial action when they become aware of safety-related defects or noncompliance situations in their products. The number of Transport Canada investigations have increased significantly over the past few years, as have safetyrelated recalls by vehicle manufacturers and importers. The department also monitors the safety performance of new motor vehicle tires and child restraint systems by conducting compliance testing, audit inspections and defect investigations. These activities contribute significantly to reducing the number of unsafe vehicles on Canadian roads.

In response to safety concerns, Transport Canada is continuing to monitor air bag performance. Transport Canada successfully launched an air bag deactivation program in 1998 for motorists who, despite taking all available precautions, deemed themselves to be at risk with air bags in their vehicles. The program, which was developed in close consultation with the provinces, vehicle manufacturers, importers, dealers and the US government, continues to serve Canadians well.

By the end of 1998, Transport Canada had processed 1,738 requests for deactivation or air bag on/off switch installations. Follow-up from dealers and repair facilities indicate that during the year, 137 on/off switches were installed and 86 air bag systems were deactivated in Canadian vehicles.

Transport Canada is also actively engaged in research to improve the level of protection for passengers during side impact crashes. The department has initiated a major crash testing program to identify the most appropriate combination of crash test dummy and moving barrier design for assessing side impact protection. As part of this program, the department reconstructs actual collisions, which were originally investigated by its Collision Investigation Teams, to compare the responses of different dummy designs with the actual injury experience of occupants.

In 1998, the department reviewed police collision reports and photographs of approximately 200 fatal collisions involving heavy vehicles to gain a better understanding of their cause. In addition, it initiated a crash test program to determine the level of performance required by rear under-ride guards to prevent passenger vehicles from sliding under the rear of large trailers (Figure 4-8).

Results of a 1998 departmental survey indicate that 89 per cent of

light duty vehicle occupants wear seat-belts. Since 1989, increased seat-belt use in Canada has saved an estimated 3,400 lives, avoided 77,000 injuries and saved over \$6 billion in social and health costs.

Under the Motor Vehicle Transport Act (MVTA), the federal government has authority over the safety of buses and trucks operating across provincial and national borders. Since 1988, the federal government, provinces and industry have cooperated in the development of motor carrier safety standards, called the National Safety Code (NSC), to ensure safe operation of commercial vehicles. NSC standards are administered and enforced by the provinces and territories. Since 1989, the federal government has contributed about \$4 million annually toward implementing the Code. By 1999/2000, the federal contribution will have totaled approximately \$44 million.

Starting in 1999, the provinces and territories will begin implementing a new performance-based NSC Standard 14, which will determine a safety rating for every carrier. Success of this new standard will depend on current and accurate data sharing amongst provinces as well as the US and Mexico, to support proper carrier safety management. The federal government is proposing to amend the MVTA to incorporate the new standard, as well as to encourage consistent standards application.

Transport Canada's regulation, research, compliance, information and accident investigation programs have collectively contributed to a significant reduction in Canada's fatality rate over the past 20 years. In 1997, the fatality rate per 10,000 registered motor vehicles was 1.74, down from 2.65 in 1986, and 4.2 in 1977.

## FIGURE 4-8 CRASH TEST EVALUATION PERFORMANCE OF POTENTIAL REAR UNDER RIDE GUARD



#### Marine

The Canada Shipping Act (CSA) governs marine safety in Canada and provides Transport Canada with the authority to establish and administer marine regulations. The department also holds the primary responsibility for all issues related to ship safety, protection of the marine environment, and marine pilotage to ensure the safety of life at sea, prevention of injury or loss of life, and avoidance of damage to property and the environment.

Transport Canada also shares responsibility for marine safety and environmental protection with the Department of Fisheries and Oceans (DFO), which regulates pleasure craft, promotes boating safety, and coordinates search-andrescue operations and national emergency preparedness and response.

Transport Canada is in the midst of modernizing the *Canada Shipping Act*. The first set of reforms were completed in 1998. The second track of reforms are

currently being drafted in a Bill that is expected to be introduced in Parliament in 1999. These amendments will complete the overhaul of the Act to promote a safe, technologically advanced and efficient marine industry.

The modernized Act provides a statutory framework for the shipping industry, which covers the registration of ships, certification of officers, provision of safety equipment, regulation of working conditions for ship crew, and construction and navigation safety. It also incorporates several important provisions that relate to compliance of domestic and foreign ships with international maritime conventions to enhance the safety of life at sea and protect the marine environment. The Port State Control program, for example, enables Transport Canada to inspect foreign ships entering Canadian ports to determine compliance with these

In addition, the International Safety Management Code, as part

of the Safety of Life at Sea (SOLAS) convention, became compulsory in 1998 for certain Canadian-registered ships engaged in international voyages and foreign-registered ships entering Canadian ports. It deals with safety and pollution prevention management by marine companies for both vessel and shore-side operations.

The new Act also incorporates amendments to regulate small passenger and fishing vessels, and special purpose ships. These vessels have been identified as high risk for accidents or incidents by the Transportation Safety Board. In the future, more inspections will be required to ensure compliance with regulations to achieve the highest possible level of safety.

In 1997/98, the department introduced marine security regulations that cover pre-board screening of persons and goods to ensure the security of passengers and crew aboard cruise ships boarding in Canada.

#### **Aviation**

Under the authority of the *Aeronautics Act*, the federal government is responsible for establishing and administering regulations for the safe conduct of civil aviation within Canada.

Canada's civil aviation transportation system is operated by NAV Canada and local airport authorities. The federal government's role, however, is to monitor and regulate the safety and security of aerodromes and airports, the licensing and training of personnel, the airworthiness of aircraft, the safety and security of commercial air services, and the air navigation system, including operating and flight rules.

The safety of air taxi operations, (helicopters and airplanes in commercial air service, excluding jets, which carry nine or fewer passengers) is monitored by a joint industry/government task force on an ad hoc basis. Its role is to determine where safety deficiencies exist and recommend ways to reduce accidents. The task force released a report in 1998 containing 71 recommendations to improve the safety of the air taxi operations. The recommendations were accepted and an implementation plan developed.

Transport Canada's ability to monitor the lease, charter and interchange of aircraft to ensure their safe operation was improved through a 1997 amendment to the *Convention on International Civil Aviation*. It allows the department to better address any potential liability or safety problems that might arise from the significant increase in these activities due to globalization of air transportation services.

The department promoted safety within the aviation community by conducting safety awareness seminars; developing videos and publications; supporting research and development initiatives related to aviation safety; working proactively with the recreational aviation community through the Canadian Sport Aviation Council; improving collection and analysis of aviation safety data; and developing safety indicators to identify and respond to system deficiencies.

To promote safety in commercial aviation operations, Transport Canada focused on improving regulations and monitoring compliance. NAV Canada's air navigation operations, for example, are closely inspected and audited by the department to ensure

compliance with technical safety standards and regulations in the *Canadian Aviation Regulations*.

A 1997/98 audit of 35 per cent of air traffic service facilities confirmed close compliance with these standards and regulations. A system-wide audit of instrument landing systems and facility power systems at NAV Canada sites over the same period identified some minor deviations from technical standards, which were immediately addressed by the corporation.

#### Multimodal

In 1998, Transport Canada launched two multimodal safety initiatives, the strategic safety plan and the performance measurement framework, to increase the efficiency, effectiveness and accountability of safety programs, service quality and client/public satisfaction.

The goal of the strategic safety plan, which applies to all modes of transportation, is to protect life, health, property and the environment; and to increase public confidence in the safety and security of the transportation system. The goal of the performance measurement framework is to measure results achieved over the years by collecting, analyzing and evaluating relevant multimodal safety data.

In response to public, industry and stakeholder requests, the department has been reducing and simplifying its regulatory activities, and completing research and development work that will contribute to improved standards and regulations in all modes of transportation.

The department is committed to reform its regulations to simplify

regulatory activities; improve and modernize the regulatory structure; and regulate smarter by pursuing regulatory alternatives, as well as alternatives to regulations, wherever applicable, without compromising safety.

As part of its regulatory reform initiative, the department has initiated the application of additional or alternative compliance tools specific to safety and security programs. In addition, the department is planning to introduce legislation in 1999 that will create a Canadian Transportation Tribunal to deal with transportation safety contravention issues.

#### Research and Development

Transport Canada's 1998 research and development program focused on safety and security issues, as well as broad federal priorities such as energy efficiency, environmental protection, competitiveness and accessibility. The research and development projects were undertaken in partnership with industry.

The 1998 fiscal year was an especially active one for the research program, with a number of safety-related improvements in all modes. Some of the highlights of the year included improved safety standards and guidelines for aircraft operations in winter, and improved flight data monitoring worldwide; improved safety, regulation and compliance for surface transportation operations; improved safety standards for rail containment systems for transportation of dangerous goods, and improved methods of inspection for railway track and equipment; improved winter performance for electric vehicles.

### **Transportation of Dangerous Goods**

The Transport Dangerous Goods (TDG) Directorate is responsible for the development of regulations, information and guidance on the transportation of dangerous goods. The Directorate also coordinates the Canadian TDG program. which is jointly administered by Transport Canada and all provincial and territorial governments. The program has two main objectives: preventing accidental releases of dangerous goods during transportation (or related activities) and mitigating the consequences of those accidents that do occur.

In 1998, TDG regulations were amended to provide new standards to improve the integrity of means of containment for rail tank cars. Similar TDG amendments for highway carriers will be completed in 1999. These amendments are expected to help reduce accidental releases through superior design and an increased ability to detect critical defects, as well as through added protection against punctures and fire impingement.

The TDG regulations were also rewritten in plain language and submitted for legal review. They will be easier to understand for the shippers, handlers, carriers and other industry personnel who have to comply with them. The new version will also provide even more harmonization between the modes of transport and between the federal and provincial requirements.

The TDG Directorate operates the Canadian Transport Emergency Centre or CANUTEC, which provides a 24-hour-a-day chemical and regulatory information service. CANUTEC advisors are professional chemists or chemical engineers experienced in interpreting scientific and technical information in order to provide advice in emergency situations involving dangerous goods during transportation.

The centre receives approximately 30,000 calls per year, the majority being non-urgent requests for information. Approximately 10 per cent of the calls, however, are of an urgent nature. Many are from people facing threats to public safety, such as police and fire-fighters at the scene of a transportation accident, concerned parents whose children have ingested cleaning compounds, or employers whose staff have been exposed to chemicals.

## Security and Emergency Preparedness

Transport Canada continued its phased withdrawal of RCMP services from international airports in 1998 to shift the cost of policing and aviation security services from government to aerodrome operators. To ensure safety compliance, Transport Canada will continue to set the regulatory requirements for policing and security services, and monitor aerodrome operators.

Another major milestone for the department was the transfer of ownership and responsibility for acquisition and maintenance of security screening equipment at Canadian airports to the Air Transport Security Corporation, a not-for-profit company acting on behalf of the air carriers. This initiative is consistent with the department's efforts to shift its role from operator to regulator, and to redirect costs to users. Mandatory equipment performance standards, to ensure detection of threatening objects,

were introduced at the time of transfer to ensure the continuity of effective screening.

The department started discussions with the Canadian aviation industry concerning the acquisition and installation of leading-edge explosives detection systems at Canada's international airports. It is currently refining a phased implementation strategy for the detection systems, based on threat and risk assessment. The new systems, for which the aviation industry will be financially and operationally responsible, will ensure that Canada is able to counter changing criminal capabilities and maintain its status as a world leader in aviation security.

In the event of year 2000 transportation contingencies, the department has developed an extensive work plan to ensure that the safety and security of the national transportation system is maintained, and that missioncritical business functions and employee safety are not compromised. The department has started processes to ensure that contingency plans are tested and that emergency response teams are ready to implement them if necessary. Coordination of departmental contingency planning with the National Contingency Planning Group (under the auspices of the Department of National Defence) is ongoing.

The first full year of implementation of the department's marine transportation security regulations for cruise ships and cruise ship facilities was successfully completed in 1998. Security inspections of major cruise ships and their operation facilities were conducted in all regions to ensure that requirements for the protection of passengers,

crew, vessels and facilities were met. Co-operation between Transport Canada and industry on the new security program will continue to strengthen the security of the cruise industry in Canada.

#### INTERNATIONAL TRANSPORT SAFETY INITIATIVES

#### Road

Transport Canada is also actively participating in international crash worthiness research activities under the auspices of the International Harmoned Research Activities (IHRA) and the International Standards Organization (ISO). The department's areas of research, include bio-mechanics, vehicle compatibility, side impact protection, advanced offset frontal protection, and intelligent transportation systems (ITS). The ITS research is intended to assess the safety implications of such vehicle technologies as collision warning, navigation and improved driver warning systems.

The department has also been a major contributor to North America-wide research into the causes of fatique among commercial drivers. In partnership with the United States Federal Highways Administration and, with the Canadian and American trucking industry, the department is participating in research that will lead to improved hour of service regimes for truck and bus drivers.

Canada hosted the 16th International Technical Conference on the Enhanced Safety of Vehicles in Windsor, Ontario, in 1998. Approximately 750 delegates from 19 countries attended the conference and exhibition. The event attracted 39 exhibitors, mostly from the US, as well as from Europe and Japan, who presented the latest advances in motor vehicle safety research. Transport Minister David Collenette delivered the keynote address.

#### Aviation

Trade liberalization has increased the need for regulatory harmonization and a strong commitment to partnership between the department, the aviation community, other governments and the public. During the year, Transport Canada continued negotiations with other International Civil Aviation Organization member states to develop bilateral air worthiness agreements/technical arrangements to improve trade harmonization such as technical arrangements on certification, maintenance and manufacturing with Japan; Memorandum of Understanding of Cooperation to produce Bell 427 helicopters in Korea; technical arrangements and certification with the joint air worthiness European member states; a certification agreement with Brazil to streamline importation of aircraft; and bilateral technical arrangements on air worthiness with Israel.

Transport Canada is developing a tri-national (Canada, United States and Mexico) aviation accident/incident reporting system to improve the comparability of aviation safety information reported by the three countries. Phase I of the study, which consisted of data collection and analysis among the three civil aviation authorities, was completed in early 1998. The department has adopted tri-national definitions of concepts and has explored several options

to develop an automated accident and incident reporting system.

#### Marine

Under Transport Canada's Port State Control program, the inspection of foreign ships to ensure compliance with international maritime conventions continues to be an effective vehicle for enhancing the safety of life at sea and the protection of the marine environment.

Canada is one of the countries that has signed two Memoranda of Understanding on Port State Control, namely the Paris and Tokyo MOUs. In March 1998. based on Canada's Port State Control initiative, ministers responsible for maritime safety in Europe, and the North Atlantic and Asia-Pacific states signed the joint ministerial declaration. "Tightening the Net" to eliminate substandard shipping. This international action demonstrates a shared commitment to safer ships and cleaner seas, as well as to acceptable living and working conditions on-board ships.

#### Multimodal

The department is increasing industry's role in promoting safety and security standards and working with them to identify and resolve potential safety issues. In addition, a data exchange initiative is being carried out jointly with the United States and Mexico to evaluate transportation in Canada on an international level and allow the department to set goals based on international standings.

## Transportation of Dangerous Goods

The new TDG regulations will provide more harmonization between the modes of transportation, between federal and provincial requirements, and between domestic and international practices. Transport Canada consults and co-operates with industry, emergency responders, carriers, all provinces and territories, the United Sates and Mexico, the United Nations Committee of Experts on TDG, the International Maritime Organization, the International Civil Aviation Organization, the International Atomic Energy Agency, the Organization for Economic Co-operation and Development and other federal departments.

The Canadian Transport
Emergency Centre and the US and
Mexico have developed the North
American Emergency Response
Guide Book, which is now
available in three languages —
English, French and Spanish.
Transport Canada distributed free
copies of the guide to ensure there
would be one in every fire-fighting
truck and highway patrol vehicle
in Canada.

#### **Research and Development**

Under NAFTA, Transport Canada is working with the United States Department of Transportation and the Mexican SCT on a five-year plan for science and technology cooperation among the three countries. The focus of the plan will be on advancements that contribute to improving transportation safety and security, facilitating trade and tourism, minimizing environmental impacts, enhancing infrastructure renewal and management, and improving accessibility and mobility.

#### PROVINCIAL/MUNICIPAL TRANSPORT SAFETY INITIATIVES

#### Rail

Provincial governments are responsible for the safety of intraprovincial short-line rail transportation. Provincial and municipal governments share jurisdiction over roadways approaching rail crossings and enforcement of provincial legislation governing driver behavior.

In general, provincial railway safety provisions are consistent with federal requirements to promote railway safety in Canada. Provincial government initiatives deal mainly with reducing railway and highway grade crossing and trespassing accidents by contributing to improvements of approach roads, crossing signals and fencing.

Regional goals and priorities for railway safety are in line with the national goals and priorities to establish and implement policies and rules, awareness and education, monitoring and enforcement, and safety programs.

#### Road

Provincial governments have significant road safety responsibilities, including driver licensing, vehicle inspection, highway infrastructure and the enforcement of highways regulations. Municipal governments are responsible for the enforcement of provincial road safety regulations and for the management of local road infrastructure within their jurisdictions.

### Transportation of Dangerous Goods

The Canadian TDG program is jointly administered by the federal, provincial and territorial governments. Provinces have full jurisdiction over the use of roads by vehicles, regardless of any other jurisdiction over the activity being conducted at the time. Therefore, there exists 13 (soon to be 14 with the creation of Nunavut in April 1999) legally binding sets of requirements for the transportation of dangerous goods. The provinces and the federal government recognize the potential for overlap and have agreed to participate jointly in a National Task Force on the Transportation of Dangerous Goods.

This Task Force brings together federal, provincial and territorial TDG representatives, who meet three times a year under the co-chairmanship of a provincial representative and the federal representative. The Task Force determines the priorities of the TDG program and decides on a common set of requirements to increase public safety. Thus, even though there exists, legally, thirteen separate sets of requirements, the results are the same.

The Minister's Advisory
Council addresses the needs,
issues and concerns of
stakeholders. Representatives from
various sectors of the industry
(production, transportation,
manufacturing and employee
safety), and from providers of
public safety (federal, provincial
and municipal governments, and
police and fire-fighters) meet three
times a year to discuss the
orientation of the program and
provide advice to the Minister of
Transport.

Because of the harmonization, every provincial TDG inspector who enforces a provincial TDG statute is increasing compliance with the federal law; any federal TDG inspector who enforces a federal TDG requirement is increasing compliance with provincial laws.

## TRANSPORTATION AND ENVIRONMENT

Dealing with the environmental impacts of transportation activity poses an ongoing challenge for Canada as well as other nations. Meeting sustainable development objectives and our international environmental commitments are important elements of addressing this challenge.

Transportation activity contributes to a range of environmental problems that affect air, land, and water - with associated impacts on human health and quality of life. Preventing and mitigating these environmental problems and their associated impacts is an ongoing challenge for Canada. In 1998, governments across Canada, industry and stakeholders continued to take action to address transport-related environmental challenges. The objective is to promote sustainable transportation by ensuring that environment, economic and social

considerations are factored into decisions affecting transportation activity.

Promoting sustainable transportation is a shared responsibility amongst government, industry and individual Canadians. This chapter provides an overview of some key initiatives undertaken in 1998 by Canadians.

## KEY DEVELOPMENTS IN 1998

## CLIMATE CHANGE<sup>1</sup> AND THE KYOTO PROTOCOL

The transportation sector was responsible for about 27 per cent of total 1995 greenhouse gas emissions or 163.5 Megatonnes CO<sub>2</sub>-equivalent. In terms of CO<sub>2</sub> emissions, transport's contribution was about 31 per cent, or 149.5 Megatonnes. This indicates that CO<sub>2</sub> emissions make up a relatively higher proportion of

<sup>1</sup> Unless noted otherwise, the information presented in this section is derived from the Transportation Sector Foundation Paper, December 1998, and Natural Resources Canada, April 1997, Canada's Energy Outlook 1996-2020.

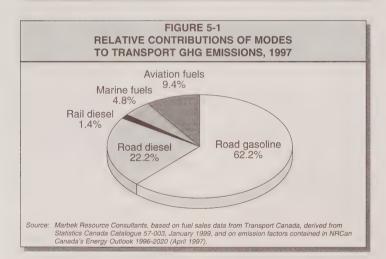
#### GREENHOUSE GASES AND CLIMATE CHANGE: THE PROBLEM

The temperature on Earth is regulated by a system known as the "greenhouse effect." Greenhouse gases trap the heat of the sun, preventing radiation from dissipating into space. Without the effect of these naturally occurring gases, the average temperature on Earth would be -18 degrees Celsius, instead of the current 15 degrees Celsius. Life as we know it would be impossible.

Scientific evidence indicates that human activities may be accelerating climate change. Levels of greenhouse gases such as carbon dioxide, methane, and nitrous oxide have increased significantly since the industrial age. Each year, the world releases 5 to 5.5 billion tonnes of carbon dioxide by burning fossil fuels. It is projected that when the amount of greenhouse gases in the atmosphere is increased, the result may be an increase in global average temperatures that in turn cause climate change.

Carbon dioxide ( $CO_2$ ) is the most significant greenhouse gas, accounting for more than 50 per cent of all contributions to global warming. Other greenhouse gases are nitrous oxide, methane and water vapour. The principal source of the  $CO_2$  releases is the burning of fossil fuels (oil products, natural gas, coal) during activities such as transportation.

Source: Environment Canada's Climate Change Website.



transportation sector emissions than in other sectors. Road transport (which includes automobiles, and light and heavy duty trucks) is the most significant contributing component. The estimated 1997 contribution of various modes to greenhouse gas emissions is shown in Figure 5-1.

#### **Kyoto Protocol**

In December 1997, the parties to the United Nations Framework Convention on Climate Change agreed in Kyoto, Japan, to a Protocol that would limit annual greenhouse gas emissions to 5.2 per cent below 1990 levels within the period 2008 - 2012. Differentiated limits were specified by country. Canada is committed to reach a level of greenhouse gas emissions that is six per cent below its 1990 level. This is a significant challenge, particularly for the transportation sector which is the largest contributor to Canada's total greenhouse gas emissions.

Immediately following Kyoto, Canada's First Ministers agreed to establish a process to examine the consequences of Kyoto and provide for the full participation of the provincial and territorial governments with the federal government in any implementation and management of the Protocol. Ministers of Energy and Environment were asked to present First Ministers with a national strategy on Climate Change by December 1999.

In April 1998, federal and provincial/territorial Ministers of Energy and Environment approved a national process for developing a climate change strategy. Fifteen Issue Tables were established to conduct this work. In May 1998, the federal, provincial and territorial Ministers of Transport agreed to create and sponsor a Transportation Table.

The Transportation Table is composed of twenty-six representatives drawn from federal, provincial and municipal governments, transport sector private organizations, environmental groups and other stakeholders in Canada's transport system. It is responsible for identifying and analyzing options to reduce greenhouse gas emissions from all aspects of Canada's transportation system. This includes all modes; fuels; passenger transport; transportation equipment (excluding manufacturing emissions); transportation infrastructure; freight transport;

urban transit; vehicle technology and standards; intermodal transportation; and transportation demand management.

By mid-1999, the Transportation Table will submit, to Ministers of Transport and the National Climate Change Secretariat, an options paper which identifies specific measures to reduce transport greenhouse gas emissions including their costs, benefits and impacts.

The Table will build an incremental package of measures designed to meet the Kyoto target. The outputs of the Transportation Table and other Issues Tables will then be integrated into options for a national strategy on climate change by December, 1999. Following broader consultations and analysis this work will be refined into a long term strategy for consideration by First Ministers

#### **CLEANER AIR**

Most air pollution is caused by the fossil fuels we burn in our vehicles, homes, thermal power plants and factories. Many chemicals have been identified in urban air pollution. A small number of these have been found to contribute to a range of air quality problems in Canada. These pollutants include nitrogen oxides (NOx), carbon monoxide (CO), sulphur dioxide (SO<sub>2</sub>), particulate matter (PM) and volatile organic compounds (VOC). When some of them combine, they produce smog or acid rain.

#### Smog

Smog is the most visible form of air pollution. The effects of smog are felt locally, regionally, and across national boundaries. In Canada, exposure to elevated levels of ground-level ozone, the major component of smog, is most severe in the Windsor-Quebec City corridor of Ontario and Quebec, southern parts of Nova Scotia and New Brunswick, and the Lower Fraser Valley of British Columbia. About 40 to 50 per cent of Canada's emissions of smogforming pollutants are attributed to activity in the transportation sector.<sup>2</sup>

Transport Canada is a partner in the Federal Smog Management Plan and continues to work towards fulfilling its commitments made in Phase 2 of the plan tabled in November 1997.

In 1998, Transport Canada participated in a number of new initiatives to mitigate air quality concerns in Canada.

Under the Environmental Standards Sub-Agreement of the Accord on Environmental Harmonization, Transport Canada is participating in the development of Canada-wide standards on particulate matter and ozone. Phase 3 of the Federal Smog Management Plan will be founded on the federal implementation strategy of these national air quality standards that all Canadian jurisdictions will formally agree to meet.

Transport Canada is also participating in a joint venture with the Montréal Urban Community (MUC) and Aéroports de Montréal (ADM) in a year-long study of airport air quality. For this purpose, the department has provided ADM with its mobile air monitoring vehicle.

This year, Transport Canada partnered with Environment Canada for the first time on its Vehicle Emissions Inspection Clinics. Largely a public awareness initiative, the clinics are conducted The Climate Change Action Fund – In its 1998 Budget, the Government of Canada committed \$150 million over the next three years to build momentum toward concrete action and results on climate change.

across Canada to better inform Canadians about emissions from the cars they drive.

On the international front,
Transport Canada is continuing its
work with the International Civil
Aviation Organization (ICAO) in a
working group addressing ground
source emissions, and its work with
the United Nations Economic
Commission for Europe (UN-ECE)
which adopted and signed protocols
on persistent organic pollutants
(POPs) and heavy metals in 1998
under the Convention on Long
Range Transboundary Air Pollution
(LRTAP).

## **Proposed Regulations on Sulphur** in Gasoline

In July 1998, the CCME endorsed a report from a federalprovincial Task Force on Cleaner Vehicles and Fuels which called for a reduction in sulphur in gasoline. In October 1998, the federal government announced that it will introduce regulations to significantly lower the allowable level of sulphur in gasoline sold in Canada. The proposed regulations would reduce the sulphur content in gasoline to an average level of 30 parts per million (ppm) with a maximum of 80 ppm. This is a 90 per cent reduction from average levels today. To reduce the impact on fuel and vehicle industries, the requirement would be phased in. In 2002, the level would be lowered to an average of 150 ppm,

Carbon dioxide (CO<sub>2</sub>) emissions are primarily linked to vehicle fuel consumption rather than the use of emission control devices. Transport Canada has jointly administered the Voluntary Fuel Consumption Program with Natural Resources Canada since 1977. Under this program, the new passenger car fleet is 50 per cent more fuel efficient than in 1973.

with a maximum of 200 ppm. The 30 ppm level would come into effect in 2005.

The primary objective of the proposed regulation is to reduce air pollution. It also has the potential to open the door for the introduction of vehicle technology that could increase vehicle fuel efficiency.

## Canada-Wide Acid Rain Strategy

In October 1998, federal, provincial, and territorial Energy and Environment Ministers signed the *Canada-wide Acid Rain*Strategy for Post-2000. The strategy builds on the successful effort of the last decade to reduce pollutants that cause acid rain. It commits governments to establishing targets and timelines for further reductions in SO<sub>2</sub> emissions.

## Diesel Engine Settlement in the US

In October 1998, the US
Department of Justice and the US
Environment Protection Agency
announced the largest civil penalty
ever for violation of environmental
law. Under this settlement, seven
major manufacturers of diesel
engines will spend more than
\$1 billion US to resolve claims
that they installed computer

devices in heavy duty diesel engines which resulted in illegal amounts of air pollution emissions. Canada's goal is to develop a solution that achieves the same effect as the US consent decrees.

# VEHICLE EMISSIONS REGULATION (MOTOR VEHICLE SAFETY ACT) AND PROPOSED AMENDMENTS TO THE CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

Motor vehicles are a major source of air pollution. Transport Canada promulgates performance based standards under the Motor Vehicle Safety Act to limit the amount of specific pollutants that can be emitted by road vehicles. Manufacturers must find ways of meeting these standards through the use of emission control and monitoring technologies. The legislative authority to regulate which is to be transferred to the Canadian Environmental Protection Act (CEPA), governs emissions of particulates (PM), carbon monoxide (CO), nitrogen oxides (NOx) and volatile organic compounds.

Since 1971, Canadian motor vehicle emission standards have been made progressively more stringent. Cars today are about 98 per cent cleaner than before emission controls were required. This has led to reductions in emissions from the transportation sector that have exceeded those from any other industrial sector of the Canadian economy. On August 20, 1997, Transport Canada published comprehensive new emission regulations in the Canada Gazette Part II. The new regulations require the more stringent control of exhaust

emissions (hydrocarbons (HC), CO, NOx and PM), evaporative emissions (mostly HC) and refuelling emissions (mostly HC) from 1998 and later model year vehicles. The new regulations include tighter emission control requirements for cars and trucks, heavy-duty vehicles and motorcycles, operating on gasoline, diesel fuel, methanol, natural gas or liquefied petroleum gas. In addition, the new regulations require that new cars and trucks be equipped with onboard diagnostic systems to monitor vehicle emission control systems for proper functioning and to alert the driver of any malfunction by illuminating a dashboard light.

Canada's new vehicle emission standards are fully harmonized with those applicable in the United States under the Environmental Protection Agency's federal emission control program. These are the most stringent national emission standards in the world and are consistent with a recommendation of the CCME's Task Force on Cleaner Vehicles and Fuels.

#### **Proposed Amendments to CEPA**

In March 1998, the Minister of the Environment introduced legislation to amend CEPA. Significantly, the proposed amendments would shift CEPA's focus from controlling pollution to preventing it. The intent behind CEPA is to protect the environment and human health to contribute to sustainable development through pollution prevention. CEPA will provide flexible legislation with the tools needed for environmental protection. Building on partnerships with all sectors of society and through the use of economic instruments and

voluntary initiatives, CEPA will promote environmental protection.

The new CEPA aims to be a key tool in the delivery of enhanced levels of environmental quality. The Act would encourage greater citizen participation by providing easy access to environmental information and by providing opportunities for public input before decisions are made. It would also allow citizens to bring civil suits in cases of significant damage to the environment if the government fails to enforce the

Elements of the amended Act that would directly affect the transportation sector include:

- New authority in CEPA to control motor vehicle and other engine emissions and to develop a new national emissions mark for engines meeting emissions requirements, and
- A national fuels mark to show that fuels meet environmental standards.

In late 1998, the proposed amendments were being reviewed clause-by-clause by the House of Commons Standing Committee on Environment and Sustainable Development.

#### ADVANCES IN R, D & D

An important element in addressing environment challenges is Canada's efforts in the area of research, development and demonstration (R, D & D). In 1998, steady progress was made in the R, D & D of vehicle and fuel technologies that result in low or zero emissions. Electric vehicles, including hybrid electric vehicles, are being produced in limited numbers by major automobile manufacturers such as Toyota, and are expected to be available in

Transport Canada's eight strategic environmental challenges:

- minimize the risk of environmental damage from transportation accidents;
- 2. promote greening of operations in the transportation sector;
- 3. reduce air emissions from transportation sources;
- 4. promote education and awareness on sustainable transportation;
- assess the department's direct budgetary transfers for their environmental impact;
- 6. refine sustainable transportation performance indicators;
- 7. understand the environmental costs of transportation; and
- 8. develop and promote the application of cleaner transportation systems and technologies.

#### **EMS ACTIVITY IN 1998**

EMS approaches were applied in a number of Transport Canada's activities during 1998 in the broad areas of resource use, land management, waste management, hazardous materials/dangerous goods management, and emergency response. Specific programs have addressed polychlorobiphenyls (PCBs), storage tanks, and the motor vehicle fleet.

#### Specific Examples

The department has introduced a No Waste program at its Ottawa headquarters. In the first eight months of operation, it was found that 83 per cent of solid waste was being diverted from landfill. This exceeded the 75 per cent target set for the program.

The department is in the process of gathering inventory information on storage tanks, contaminated sites and ozone depleting substances in order to develop an environmental information management system.

As part of its divestiture process, all airports and ports in the process of being transferred undergo environmental baseline studies to determine whether remediation will be required. In addition, NAV CANADA properties have undergone Phase I site assessments and based on this information more detailed assessments will now be undertaken.

The Department conducted and approved 268 environmental assessments in accordance with the Canadian Environmental Assessment Act (CEAA).

Canada in the next few years. Hydrogen-powered buses, using technology developed in Canada, are being tested in various jurisdictions. (The chapter entitled *Transportation and Energy* provides further information about Ballard's fuel cell power systems.)

## TRANSPORT CANADA'S SUSTAINABLE DEVELOPMENT STRATEGY - AN UPDATE

The Transport Canada Sustainable Development Strategy (SDS), tabled in Parliament in

### 1998 REPORT OF THE COMMISSIONER OF THE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

In May 1998, the Commissioner of the Environment and Sustainable Development reported that 28 federal government departments and agencies had prepared their first sustainable development strategies and tabled them in the House of Commons. The Commissioner noted that Transport Canada and other departments now face three main challenges:

- 1. Implementing their strategies
- 2. Establishing clear and measurable targets
- 3. Updating their strategies by the end of 2000.

Selected Comments by the Commissioner of Environment and Sustainable Development note that,

"This first round of sustainable development strategies represents a significant step forward. We now have a picture of how each department views sustainable development and of the actions each one intends to take to promote it."

"Climate change is perhaps the most daunting of a new generation of environmental problems testing governments around the world. It involves questions that go to the heart of how we live and how we make our living..."

"In a number of areas, the federal government is failing to meet its policy commitments because it is paying too little attention to the management side of the sustainable development question."

"Most departments failed to set the clear targets that could be used internally to judge whether or not the strategy is being successfully implemented. And many strategies restate the status quo rather than making new concrete commitments that will better protect our environment and promote sustainable development."

Transport Canada is working to address these concerns.

December 1997, identified eight strategic environmental challenges on which to concentrate efforts. The challenges focus on promoting sustainable development in the transportation sector, and in the management of the Department's own operations.

During 1998, the department worked in partnership with others to begin to implement its SDS. To this end, Transport Canada has developed a comprehensive sustainable development action plan. Some of these efforts build on existing initiatives, recognizing their contribution to sustainable development. Of particular note are the following:

Environmental Management System (EMS) — Transport Canada is in the process of implementing a department-wide EMS. Using the principles of ISO 14000, it has developed a system that will incorporate environmental considerations into all aspects of operational decisionmaking.

Strategic Environmental Assessment - In addition to assessing the environmental impacts of projects, Transport Canada is committed to strategic environmental assessment of policies and programs. The Department worked with the Canadian Environmental Assessment Agency (CEAA) and other federal departments to develop an action plan and implementation strategy entitled Integrating Policy Environmental Assessment into the Federal Decision-making Process.

Reducing Air Emissions — As noted in earlier sections on climate change and cleaner air, this was a major focus of activity for governments as well as for the transportation industry and other stakeholders.

# TRANSPORTATION PROGRAMS AIMED AT IMPROVING ENVIRONMENTAL QUALITY

A number of federal and provincial Canadian programs relate specifically to transportation and the environment (primarily air quality). Some of these programs are described briefly below.

#### BRITISH COLUMBIA'S CLEANER VEHICLES AND FUELS PROGRAM<sup>3</sup>

The primary purpose of this program is to control the emission of smog precursors. As a secondary benefit, it may also reduce greenhouse gas emissions. The program is operated by the Clean Vehicles and Fuels

Program, Ministry of Environment, Lands, and Parks, Province of British Columbia.

#### **Cleaner Vehicles**

In 1995, BC launched tough auto emissions standards primarily aimed at reducing smog. The new regulations require that, starting in the year 2001, all new cars sold in the province must meet the same Low-Emission Vehicle (LEV) standards as in California. A LEV produces up to 70 per cent less emissions (smog) than pre-1996 vehicles (Tier 0). As part of the regulation, between 1996 and 2001 manufacturers will have to identify other measures to reduce vehicle emissions. The regulation also sets targets to bring Cleaner Technology Vehicles to the BC market: five per cent of new vehicle sales by the year 2001; ten per cent by the year 2003.

Other provincial government initiatives have included support for natural gas transit buses, Ballard Power Systems fuel cell technology, and lower emission vehicles for fleets.

#### **Cleaner Fuels**

BC adopted a regulation requiring new "clean air" standards for the quality of gasoline sold in the province, beginning in 1996. The standards target benzene and sulphur.

## VEHICLE INSPECTION AND MAINTENANCE PROGRAMS

All new motor vehicles sold in Canada must meet stringent pollution standards. However, if the vehicle is tampered with or the pollution control equipment is not properly maintained, the environmental benefits of improved technology are lost. Inspection and maintenance (I/M) programs attempt to respond to this problem. The programs are recommended for areas where motor vehicles are a major source of harmful emissions, where air pollution is a problem, or as a pollution prevention measure. The effectiveness of the programs in reducing pollution is currently the subject of some debate.

I/M programs involve the regular inspection of motor vehicles to verify the presence of pollution control equipment and to ensure compliance with provincial emissions limits. When a vehicle that exceeds pollution limits is detected, the vehicle must be repaired.

To facilitate the development of a uniform and consistent approach to I/M programs across Canada, a task force made up of environmental groups, government, and industry stakeholders developed an Environmental Code of Practice for Motor Vehicle Emission Inspection and Maintenance Programs.

Three provincial I/M programs are described below.

## British Columbia's AirCare® Program<sup>4</sup>

AirCare is the provincial vehicle emissions inspection-and-maintenance program that has been in place in the Lower Fraser Valley since 1992 (also directed primarily towards reduction of smog). The program is managed by the Clean Vehicles and Fuels Program, Ministry of Environment, Lands, and Parks, Province of British Columbia.

Standards were strengthened in 1995. The program, developed jointly by the Province, the Greater Vancouver Regional District (GVRD) and Environment Canada, requires that all light-duty vehicles pass an annual emissions inspection as a condition of licensing. Vehicles that fail the test have to be repaired and re-tested at approved service centres. Full repairs, although encouraged, are not required if they cost the owner more than a set repair-cost limit. which varies according to the age of the vehicle.

The program reduces nitrogen oxides and volatile organic compounds, precursors of ground-level ozone and secondary fine particulate. Emissions of nitrogen oxides have been reduced by three per cent; volatile organic compounds by 18 per cent; and carbon monoxide by 24 per cent.

Reports indicate that fuel savings resulting from AirCarerelated repairs are estimated to be over \$7 million per year.<sup>6</sup>

#### **Ontario Drive Clean**

Drive Clean was originally introduced in August 1997 and was scheduled to take effect in 1998. The start-up date has been postponed until spring 1999. The program is positioned as a major initiative to fight smog.

A new regulation under the Ontario Highway Traffic Act will require proof of an emissions certificate for renewing registration and transferring ownership of cars and other lightduty vehicles (under 4,500 kg). This sets the stage for the province's Drive Clean Program. It specifies the model ages of

- 4 From BC Environment website.
- 5 National Round Table on the Environment and the Economy, 1996, Backgrounder on Sustainable Transportation in Canada, p.47.
- 6 BC Environment, Lands & Parks website

vehicles covered under Drive
Clean and how often they must be
tested. Vehicles that fail the test
have to be repaired and re-tested at
approved service centres. The new
regulation will come into effect on
April 1, 1999 in the Greater
Toronto Area and HamiltonWentworth region for passenger
cars and light trucks. On
January 1, 2001 it will extend
to 13 other urban areas.

Drive Clean will later apply province-wide to heavy-duty vehicles (more than 4,5000 kg). Antique vehicles (20 years old or more), commercial farm vehicles and motorcycles are excluded from the program. Motorcycles will be included when recognized emissions standards are in place.

#### Quebec Inspection and Maintenance

The province of Quebec announced a two-year voluntary I&M pilot program in 1997. The program is being managed by the "Association québécoise pour la lutte contre la pollution atmosphérique" and is sponsored by the provincial Ministry of Environment, Environment Canada, and others. The program operated from April to October 1997 with voluntary clinics held throughout the province. Voluntary clinics were also held during the summer of 1998.

#### GUIDELINES FOR EVAPORATIVE EMISSIONS CONTROLS

Transportation-related emissions result not only from fuel combustion when the automobile is in operation, but also from evaporation of the fuel itself before it is burned in the car engine. There are two methods to

avoid evaporative emissions from gasoline fuel: vapour recovery and gasoline volatility limits.

Environment Canada and the CCME have developed guidelines to reduce the evaporation of gasoline at service stations. Gasoline volatility is also regulated during the summer months in certain provinces to reduce evaporative emissions.

## LOCOMOTIVE EMISSIONS MONITORING PROGRAM<sup>7</sup>

The 1995 Memorandum of Understanding between Environment Canada, CCME, and the Railway Association of Canada (RAC) requires the RAC to make an annual report to Environment Canada concerning the emissions of exhaust gases, particularly oxides of nitrogen, from locomotives. The MOU does not include voluntary undertakings to reduce the emissions, but it does commit the railways to monitor and report them. The MOU was developed from the recommendations contained in the ioint Environment Canada/Railway Association of Canada report entitled Recommended Reporting Requirements for the Locomotive Emissions Monitoring Program. The report is to include data on the traffic moved and the fuel consumed, estimates of the consequent emissions of certain exhaust gases, and information on any improvements in equipment or operating practices that will lead to reduced emissions. As part of the agreement, the RAC also agreed to monitor developments in railway operations technology and to encourage member railways to implement new cost effective

technologies that will reduce the

emissions from their new equipment.

The first annual report, based on data up to 1995, was published in 1997. The annual fuel consumption rate in gallons per 1,000 Gross Ton-Miles showed an average annual decrease of 1.9 per cent over the 1990 level. This initiative will continue with further reports as data becomes available.

## TECHNOLOGY PARTNERSHIPS CANADA (TPC)

Environmental industries and their related technologies are a key target area for investment by Technology Partnerships Canada (TPC), an Industry Canada program of targeted repayable investments. For example, TPC invested \$30 million in Ballard Power Systems, developers of fuel cell technology, and \$4.3 million in GFI Control systems to develop gaseous fuel engine control systems for alternative transportation fuel vehicles.

#### LOOKING AHEAD

Governments across Canada, industry and stakeholders will continue to take action to address transport-related environmental challenges. The objective is to promote sustainable transportation by ensuring that environmental, economic and social considerations are factored into decisions affecting transportation activity. Partnerships and clear and open lines of communications will be essential in achieving this objective.

<sup>7</sup> Environment Canada, November 1997, Locomotive Emissions Monitoring, Reporting Year 1995, EPS 2/TS/10

## TRANSPORTATION AND ENERGY

Energy plays a vital role in the transportation sector. Energy and sustainable development are closely linked.

Given the current technology available to move transportation equipment, energy plays a vital role in transportation activities.

- It is an essential input to transportation activity. The growth in transportation needs could not have been satisfied without access to sufficient energy supply to look after the said needs.
- It represents, on average, 12 per cent of the cost of transportation. It is preceded in terms of importance by the costs of labour, materials, goods and services, and capital, which respectively account for

- 35 per cent, 26 per cent and 17 per cent of the total.
- In 1996, the transportation sector accounted for 2029 petajoules, or 26.6 per cent, of secondary energy demand in Canada<sup>1</sup>; and for close to 60 per cent of all petroleum use in Canada.
- Between 1990 and 1996, transportation energy use and transportation activity grew for both passenger and freight transport activities. But transportation activity grew at a more rapid pace than that of the sector's energy use, an indication that energy savings were taking place in transportation activities.

But savings were not sufficient to offset the growth in transportation demand.

## Transportation and the Environment

The energy consumed in transportation activities accounts for 27 per cent of Canada's greenhouse gas emissions. The relationship between transportation energy use and the environment, including a discussion of greenhouse gas emissions and climate change, was covered separately in the previous chapter entitled Transportation and Environment

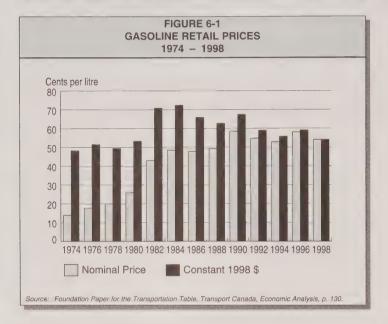
<sup>1</sup> Natural Resources Canada, Office of Energy Efficiency. Energy Efficiency Trends in Canada, 1990-1996 (June, 1998)

Pa:

## TABLE 6-1 GROWTH BETWEEN 1990 AND 1996 IN ENERGY USE AND TRANSPORTATION ACTIVITIES

	Energy Use	Transportation Activity
ssenger Transportation eight Transportation	+ 9.8% + 11.0%	+ 17.8% + 14.7%

Source: Natural Resources Canada, Office of Energy Efficiency report "Energy Efficiency Trends in Canada 1990 to 1996", June 1998, p.49.



## DEVELOPMENTS IN 1998

#### CHANGES IN THE PRICE OF OIL AND PETROLEUM PRODUCTS

As shown in Figure 6-1, gasoline prices are at their lowest levels in about 20 years. As for other goods, transport-related consumption of energy has some inverse relationship between price and quantity used. The cost of fuel is one of the factors that comes into play in transportation decisions. On the passenger side, for example, the choice between

private and public transport services or the type of personal transport vehicle to purchase are influenced to some degree by the price of fuel.

#### DEVELOPMENTS IN ENERGY-RELATED TRANSPORTATION R&D

Some of the ongoing research and development (R&D) in the transportation sector supports the development of technologies improving fuel efficiency and/or new environmentally friendlier sources of energy for the benefits of Canadians. Developments arising out of transportation R&D in recent years are highlighted

below. (The chapter entitled Transportation and Environment identified other R&D developments that have both energy and environmental impacts.)

- · Of particular interest is the vehicle technology R&D conducted by Ballard Power Systems of Vancouver. Ballard is the world leader in the development of proton exchange membrane fuel cell power systems. The Ballard Fuel Cell is a proprietary zero-emission engine that converts natural gas, methanol, gasoline, or hydrogen fuel into electricity without combustion, and consequently without emissions. During 1998, Ballard reached agreements with General Motors, Ford, Daimler-Benz and Honda respectively to supply a range of products and services that would advance the penetration of fuel cell technology into the market.
- · Another significant development is the joint venture between Iogen, an Ottawa-based company, and Petro-Canada regarding the production of ethanol fuel. The venture will include the construction of a \$15 million to \$30 million ethanol test plant at Iogen's Ottawa facilities, plus a licensing option for Petro-Canada to build full-scale ethanol refineries. The test plant will use Iogen's patented process to convert straw, corn stalks and wood waste into biomass based ethanol.

#### ENERGY DEMAND

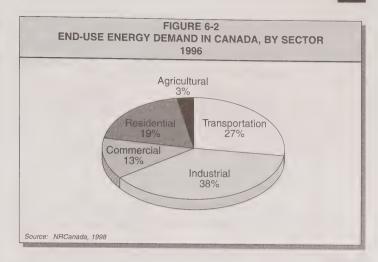
Figure 6-2 below illustrates the breakdown of end-use energy demand in the four principal sources of use of energy using sectors in Canada.<sup>2</sup> It shows that the sector accounted for 2,029 petajoules, or 26.6 per cent of total end-use energy demand in Canada in 1996. At that time, the transportation sector was second only to the industrial sector in terms of energy end-use, followed by the residential and commercial sectors.

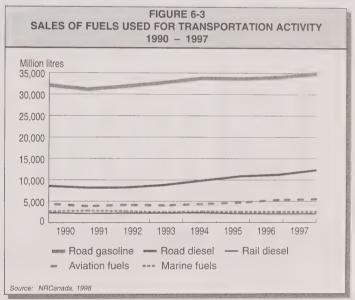
#### FUEL SALES

Transport Canada uses fuel sales as the key indicator of energy use. Canadian refinery fuel sales indicate that total sales of fuels used for transportation activity grew by over 14.1 per cent between 1990 and 1997. Overall, fuel sales increased by almost four per cent between 1996 and 1997 alone.

Much of the upward trend in fuel sales is attributable to an increase of over five per cent in sales of road diesel fuel over the 1990-1997 period. Sales of road gasoline and marine fuel have remained relatively stable. Figure 6-3 shows the trend in sales for each of the fuels used in the transportation sector between 1990 and 1997. (See the section entitled Factors Influencing Transportation Energy Use for a discussion of possible reasons for the trends.)

Figure 6-4 shows how much each mode contributes to the total use of fuels for transportation activities. Motor gasoline and road diesel fuel together accounted for over 80 per cent of fuel sales.





Aviation fuels (comprised of aviation gasoline and jet fuels) accounted for most of the balance.

Alternative transportation fuels include propane, natural gas, methanol, ethanol, electricity and hydrogen. Overall, alternative fuels programs in Canada and the U.S. have had limited success in replacing conventional fuels such

as gasoline and diesel. Even with Canada's abundant supplies of domestic natural gas, propane and natural gas have had only limited market success, achieving two per cent and 0.5 per cent market shares respectively. About 20,000 vehicles operate on natural gas; 150,000 vehicles operate on propane.<sup>3</sup>

- 2 Natural Resources Canada, Office of Energy. Efficiency, Energy Efficiency Trends in Canada 1990 to 1996 (June 1998)
- 3 Transportation Table on Climate Change Foundation Paper, December 1998.

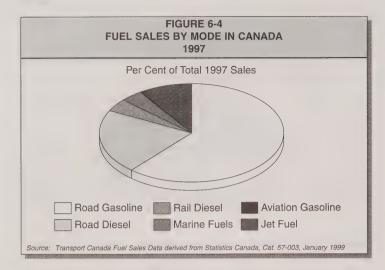


TABLE 6-2 CONSUMPTION OF CONVENTIONAL AND ALTERNATIVE FUELS										
1995										
nt Per Cent	Fuel									
73.3	Gasoline									
24.0	Diesel									
2.0	Propane									
0.5	Natural Gas									
0.2	Electricity									
0.1	Other Fuels (e.g. ethanol)									
100.0	Total									
)	Other Fuels (e.g. ethanol)									

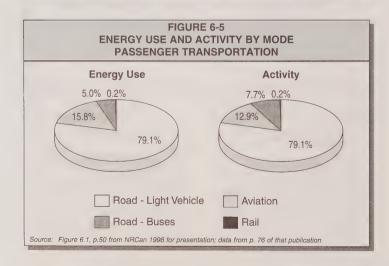


Table 6-2 presents the shares of conventional and alternative Canadian fuel consumption in 1990 and 1995 respectively.<sup>4</sup> It shows that diesel fuel demonstrated the most growth, apparently at the expense of gasoline, and that alternative fuels have made modest inroads over the period.

#### ENERGY USE BY TRANSPORTATION MODE

Transportation energy use is composed of a passenger segment, the largest and dominated by light vehicle use, and a freight segment. According to Natural Resources Canada (June 1998), the passenger sub-sector, comprising road, rail and air passenger activity, accounts for 64.7 per cent of transportation energy used. The freight sub-sector, including road, rail and marine freight activity, accounts for the balance. From 1990 to 1996, passenger transportation energy use increased by 9.8 per cent; freight transportation energy use increased by 11.0 per cent over the same period.

Within the passenger sub-sector, light vehicle road passenger transportation is the most significant mode in terms of energy use (see Figure 6-5). It accounts for 78.9 per cent of both energy use and activity (passenger-kilometres). The breakdown of energy use and activity within the freight subsector are shown in Figure 6-6. Within the freight sub-sector, trucks account for 72.7 per cent of energy use, while the marine subsector accounted for 15.5 per cent and rail for 11.8 per cent.

4 1995 is the most recent year for which NRCan has complete data.

#### FACTORS INFLUENCING TRANSPORTATION ENERGY USE

Transportation energy use is influenced by the following factors:

- Fuel efficiency
- · Level of transportation activity
- Other factors such as stock replacement, mix of vehicle types in the stock and vehicle operation and maintenance

These will be discussed briefly below.

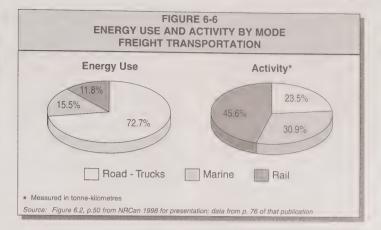
#### FUEL EFFICIENCY

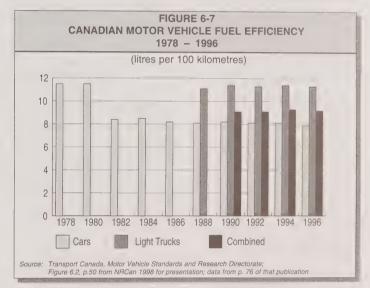
Fuel efficiency in vehicles is a measure of how much fuel is consumed over a set distance.

Traditionally it is represented in terms of litres of fuel per 100 kilometres travelled. Vehicle fuel consumption is a function of the efficiency of vehicle weight and fuel technology, as well as other factors.

An ongoing interest in reducing transportation energy use has resulted in a continuing focus on fuel efficiency. Since the oil price shock of the 1970s, cars and light trucks have become more and more fuel efficient. Figure 6-7 illustrates an improvement in car fuel efficiency from 11.5 L/100 km in 1979 to 7.9 L/100 km in 1996. The improvement in fuel efficiency has been attributed to vehicle weight reductions and advances in technology. Light truck fuel efficiency has also improved since the late 1970s. It is currently at about 11.2 L/100 km.

A change in the structure or "shape" of the fleet can affect the amount of energy used in the transportation sector as a whole.





Because of the relative importance of the passenger sub-sector, shifts in the mix of activity between small cars, large cars and light trucks, for example, can have an impact on energy use. Choosing more efficient vehicles can reduce overall fleet energy use. The impact of a shift from small and large cars to light trucks, with all other factors remaining equal, was to increase light-duty vehicle energy demand by 10 petajoules.<sup>5</sup>

The fuel efficiency of various types of transportation modes is discussed below.<sup>6</sup> In principle, a number of technological changes could improve vehicle fuel efficiency in all modes. The opportunities to take advantage of these advances is time-lagged because it takes time to design new vehicles, convert plants to produce them and replace the fleet.

<sup>5</sup> NRCan, 1998

<sup>6</sup> Transportation Table on Climate Change -- Foundation Paper, December 1998

#### Road Transportation -Automobiles and Light Trucks

Data indicates that the company average fuel efficiency of new passenger cars has not improved significantly since 1986, and that of light-duty vehicles (new cars and light trucks combined) has not changed significantly since 1982. Reasons for this lack of significant improvement include the increasing preference by consumers for less fuel efficient light trucks over automobiles, lower gasoline prices and the need to meet consumer preferences for vehicle performance. Competing design considerations also inhibit improvements to fuel economy. In certain cases, fuel economy benefits have been realized, but have been offset by safety features such as air bags and increased emission controls which add weight to the vehicle and reduce its efficiency.

#### Road Transportation - Heavy Trucks and Buses

Heavy truck and bus fuel consumption has improved less than that of light duty vehicles over the past 20 years. One important reason for this is that heavy-duty vehicles were already more energy efficient than passenger vehicles on the basis of fuel consumption per unit of weight. Use of the efficient diesel engine is largely responsible for this advantage. Diesel engine designs are improving steadily. For example, turbocharged directinjection diesels offer fuel savings of 30 per cent to 40 per cent compared with gasoline engines.

#### Rail Transportation -Locomotives

Since the mid 1990s, the North American manufacturers of diesel electric locomotives introduced alternative current (A.C.) traction for railroad motive power, increasing substantially the horsepower of the diesel engine. A.C. locomotives offer improved performance and reliability. One A.C. 6000 horsepower diesel engine unit permits the replacement of two existing locomotives. According to Industry Canada (June 1998), Canadian Pacific's acquisition of 262 new AC traction locomotives should decrease the carrier's fuel consumption by 20 per cent.

#### **Marine Transportation - Ships**

New developments are taking place in two areas with respect to marine engines: gas turbines and diesel electric systems. Although they may offer significant advantages, actual estimates of the fuel consumption potential for these technologies are not available.

## Air Transportation - Aircraft Technology

The fastest growing of all transport modes, commercial air travel has also made the greatest strides in improving energy efficiency. From the early 1960s to the mid 1990s, the fuel consumption per passenger seatkilometre of newly certified aircraft in Canada decreased by approximately 50 per cent. This decrease was due to improved aerodynamic efficiencies, larger capacity aircraft, as well as engine technology improvements. Energy use per passenger-kilometre was also reduced due to increased load factors (passenger-kilometres per available seat-kilometres), and improvements in operating procedures.

In the last half of the 1980s, improvements slowed, due to slower stock turnover, lower jet fuel prices, and worsening air traffic congestion.

## TRANSPORTATION ACTIVITY LEVELS

Transportation activity is typically measured as passengerkilometres for passenger transportation, and tonne-kilometres for freight transportation.

Changes in activity levels were the most significant factor causing energy use to increase from 1990 to 1996. Had activity not changed, passenger and freight transportation energy use would have been 206 petajoules and 86 petajoules lower, respectively, in 1996 than they actually were (NRCan, 1998). More people, more vehicles, more kilometres!

As noted previously, the transportation sector includes passenger and freight transportation. The passenger sub-sector is the largest, accounting for 64.7 per cent of transportation energy use. Light vehicle road passenger transportation is the most significant mode of the passenger sub-sector, accounting for 78.9 per cent of both energy and activity passengerkilometres. Combined with buses, road transport accounts for 83.9 per cent of energy and 86.8 per cent of passenger kilometres. The remaining energy and activity are accounted for mainly by the air sector. This profile suggests that changes in the level of activity in the passenger sub-sector would have the most direct impact on how much energy is used in the transportation sector as a whole.

From 1990 to 1996, light vehicle activity, defined as passenger-kilometres, increased by an estimated 20.9 per cent.
Improvements in the fuel efficiency of the fleet achieved over the period were not sufficient to offset the increase in light vehicle transport energy use.

Increases in the level of road passenger transportation activity are due to a range of factors including population growth, an increase in the stock of vehicles used for passenger travel, a decrease in the cost of driving a private vehicle relative to the cost of urban and intercity bus transport, and changes in socio-economic-demographic conditions such as urban sprawl.

Activity in the freight sub-sector includes the movement of goods by trucks, rail and marine. Freight trucking accounts for the largest share of freight energy use. followed by marine and rail. Activity distribution, defined as tonne-kilometres, is significantly different than energy use as trucks account for only 23.5 per cent of total freight activity, while rail and marine account for 45.6 and 30.9 per cent respectively7. This reflects the fact that rail and marine carry bulk commodities while trucks tend to carry more lightweight goods (e.g. consumer goods, parts).

Over the period 1990 to 1996, freight activity increased by 14.7 per cent. An increase in road freight activity, amounting to 44.2 per cent, was the largest contributor to the overall growth of total freight activity. Rail and marine activity also increased over the period, but by smaller amounts, 12.9 per cent and 1.2 per cent respectively.

A key factor that drives the level of freight transportation activity is economic activity. Increases in the general level of economic activity often result in increases in the level of freight transportation activity.

#### OTHER FACTORS

Other factors can potentially affect how much transportation energy is used. These include vehicle stock replacement and vehicle operation and maintenance practices.

#### Vehicle stock replacement

As the fuel efficiency of new vehicles improves and older less efficient vehicles are replaced, the overall efficiency of the transportation fleet improves. Fleet turnover has had a significant impact on fleet fuel efficiency over the 1990-1996 period. In 1990, 19 per cent of the car stock was 1970 vintage, compared to four per cent in 1996. Over the same period, 1990 vintage vehicles grew from six per cent to 45 per cent of the stock.8 Despite these efficiency improvements, the shift to a newer vehicle stock has not been sufficient to outweigh the overall increase in fuel use caused by increased levels of transportation activity.

## Vehicle operation and maintenance practices

Speed, acceleration and idling practices are some of the elements of driving that can affect the amount of energy used by a vehicle; routine tune-ups can also have a beneficial impact.

#### CANADA'S FUEL EFFICIENCY PROGRAMS

Fuel consumption plays a significant role in how much energy is used for transportation, and a number of Canadian initiatives are consequently aimed at promoting transportation fuel Transportation activity is typically measured as passenger-kilometres for passenger transportation, and tonne-kilometres for freight transportation.

efficiency. Some of these programs are described briefly below.

# MOTOR VEHICLE FUEL CONSUMPTION STANDARDS ACT AND MOTOR VEHICLE FUEL CONSUMPTION PROGRAM

The joint Government-Industry Voluntary Fuel Consumption Program set the first Company Average Fuel Consumption (CAFC) targets for automobiles in 1980; subsequently, government passed Bill C-107, the Motor Vehicle Fuel Consumption Standards Act (MVFCSA). This legislation exists as an alternative

## TRANSPORTATION DEMAND MANAGEMENT (TDM)

The goal of TDM is to modify how consumers use the transportation system. TDM attempts to decrease transportation activity levels by reducing the frequency of trips, reducing the average length of trips, and increasing vehicle occupancy. Typically, TDM includes a range of approaches such as tele-commuting, ridesharing and alternative work scheduling.

The impacts of TDM on transportation activity has not been determined unequivocally; further research is required.

<sup>7</sup> NRCan, (1998)

<sup>8</sup> NRCan, (1998)

to voluntary fuel efficiency standards. The program sets voluntary fuel efficiency standards for new vehicles, and encourages manufacturers to produce and sell more fuel-efficient cars and light trucks. Under the program, motor vehicle manufacturers have to meet voluntary annual Company Average Fuel Consumption targets for new light vehicles sold in Canada, A 1995 Memorandum of Understanding between Natural Resources Canada and key vehicle manufacturers provides an opportunity to expand the voluntary commitment by manufacturers on vehicle fuel efficiency. It incorporates a more balanced approach to improving motor vehicle fuel efficiency. including initiatives aimed at vehicle owners and operators as well as new vehicle technology.

#### ENERGUIDE LABELLING PROGRAM FOR VEHICLES

This program, which was developed jointly by government and industry, replaces the longrunning fuel consumption labelling program administered until recently by Transport Canada. Under the new program, motor vehicle manufacturers voluntarily affix fuel consumption labels to new vehicles offered for sale. The label will also show the estimated fuel cost of the vehicle. This allows buyers to compare the average city and highway fuel consumption ratings of all new cars, vans, and light-duty trucks, and to assess the potential economic and environmental savings that can be realized by choosing to purchase one vehicle over another.

The program produces and distributes over 400,000 Fuel Consumption Guides that provide vehicle buyers with the fuel consumption ratings for all new,

light-duty vehicles. The Guide is published annually by Natural Resources Canada in cooperation with the vehicle industry and Transport Canada.

#### **AUTO\$MART**

Auto\$mart encourages energyefficient and environmentallyresponsible decisions. Its approach involves the dissemination of information materials and joint initiatives concerning personal vehicles with public sector and private sector partners. NRCan delivers this program, working with the private sector and other levels of government to develop the information products that communicate the required information. Auto\$mart information products include: the Auto\$mart Student Driving Kit, the Auto\$mart Fuel Consumption Guide, the Fuel Economy Calculator, a 1-800 line, a web site, etc. The education components include a student driving kit, car care clinics, and other elements, such as a syndicated radio program, that are still under development.

Each year the program distributes about 300,000 publications, and reaches 400,000 new drivers through 600 participating driver-educators.

#### FLEET ENERGY PROGRAM

The aim of this program is to increase energy efficiency and the use of alternative transportation fuels in the public sector and commercial fleets. It consists of two elements: FleetWise and FleetSmart.

#### **FleetWise**

This program incorporates information, tools and services, is aimed at assisting federal departments to cut costs and reduce emissions from the

operation of federal fleets. The approach to achieving the program goals is to increase fuel efficiency and use alternative transportation fuels in federal government vehicles. The program is managed through an Interdepartmental Task Force that includes NRCan, Treasury Board, Environment Canada, and Public Works and Government Services Canada.

#### FleetSmart

The FleetSmart program encourages other Canadian fleet operators to reduce operating costs through energy-efficient practices and the use of alternative fuels. Announced in 1997, the program works in partnership with fleet and industry associations, vehicle and engine manufacturers, and equipment suppliers. The program develops energy use data and profiles for fleet segments and provides a range of products such as a FleetSmart Tool Kit, an Internet site (fuel prices and source lists), success stories, and studies that identify best practices, and a SmartDriver training alternative. About 400 fleets are registered in the program, representing over 90,000 vehicles.

## TRANSPORTATION EFFICIENCY R&D PROGRAMS

The NRCan Transportation
Efficiency R&D program supports
the development of technologies to
reduce fuel consumption in
Canada. Research and
development focus on high fuelefficiency, low emission
technologies. The program,
suspended temporarily,
recommenced with new funding
in April 1998.

# TRANSPORTATION AND REGIONAL ECONOMIES

Provincial transportation investment ranges between 11.3 and 37.8 per cent of their total investment, most of which is road related. The value-added of commercial transportation, as a percentage of provincial GDP, is between 2.9 and 5.9 per cent.

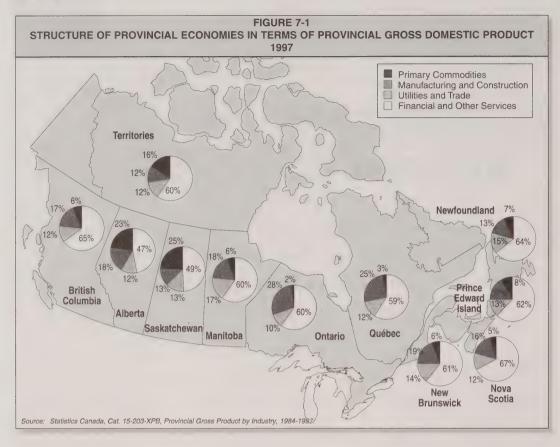
From the beginning of Canada as a nation, transportation has been a vital link in the interlocking chain of dreams and practicalities that have made this vast country economically viable. At Confederation, road, marine and rail transportation were the essential components of the new

nation's productivity infrastructure. Today, while air transportation has become a major addition to Canada's transportation mix, the road, marine and rail modes are still essential contributors to the nation's economy. This section examines the role played by all four modes

in contributing to the individual economies of each province and territory.

The discussion is based on the application of three indicators: the value-added 1 of commercial transportation 2, total transportation demand 3, and investment 4 by

- Value-added refers to payments such as wages and profits made to labour and capital used in production throughout the provincial economy. Because value -added is determined by payments to labour and capital, transport's importance to a province's economy is determined by the location of the workers and capital employed by commercial carriers. Value-added measures the production or supply of transport.
- 2 Commercial transport can be defined as "industries that charge fees to transport goods, passengers or both." Commercial transport is part of "total transport," where total transport also includes private spending on transport (such as consumer purchases of cars) and government expenditures on transport (such as highway maintenance and construction).
- 3 Total transport demand measures transport sales to consumers, businesses and governments within the province. In contrast to value-added, total transport demand includes private and government expenditures on transport, as well as sales of commercial carriers. Using total transport demand means that transport's importance to a province's economy depends on the location of the consumers, businesses and governments that pay for transport.
- Whether made by business or government, "transport investment" can be defined as both new infrastructure construction and purchases of new machinery and equipment. Investment excludes repair and maintenance expenditure, which are expenditures on existing infrastructure, machinery and equipment.



businesses and governments in transportation infrastructure and machinery. The value-added of commercial transportation can be compared with provincial gross domestic product (PGDP), the standard measure of a province's total value of production. Total transportation demand can be compared with a province's final domestic demand (PFDD), a measure of the total value of sales in a provincial economy. The two aggregate economic measures are related, in that PGDP is equal to PFDD, plus the trade balance.

## THE SUPPLY OF TRANSPORTATION

The importance of transportation sto a provincial economy, and its predominant modes of transportation, are primarily determined by the province's geography, its economic structure (particularly its production of primary commodities), and its share of both interprovincial and international trade. An additional determinant of transportation's importance to provincial economies is the province's proximity to

central Canada: provinces adjacent to the central provinces of Ontario and Quebec act as hubs for transportation moving in and out of Central Canada. Both Manitoba and New Brunswick are in hub positions, and enjoy a larger share of transportation activities than the other provinces in eastern and western Canada. Similarly, the large transportation component in British Columbia's economy reflects its position as a gateway for trade with the Pacific Rim countries.

<sup>5 &</sup>quot;Transportation" in this subsection refers to commercial transportation.

TABLE 7-1 ANNUAL GROWTH IN PROVINCIAL ECONOMIES, REAL GROSS DOMESTIC PRODUCT 1997

		(Per cent)			
Province/ Territory	Primary Commodities	Manufacturing and Construction	Utilities and Trade	Financial and Other Services	Total Economy
Canada	2.0	6.4	4.0	3.2	3.9
Newfoundland	14.5	-4.0	4.3	1.2	1.7
Prince Edward Island	6.3	-1.0	5.1	1.7	2.0
Nova Scotia	-6.1	4.7	7.0	1.1	2.0
New Brunswick	-6.3	-2.0	4.2	1.5	0.7
Quebec	-0.1	3.9	3.3	1.6	2.4
Ontario	0.2	6.8	4.2	3.5	4.4
Manitoba	0.7	10.4	5.4	3.1	4.6
Saskatchewan	5.3	14.2	5.4	4.7	6.0
Alberta	4.1	16.5	6.9	6.0	7.5
British Columbia	-1.3	1.2	0.5	3.2	2.3
Territories	-16.2	14.2	-1.2	1.8	-0.7
Source: Statistics Canada, Cat. 15-2	203-XPB, Provincial Gross	Product by Industry, 1984-1997			

#### ECONOMIC STRUCTURE OF PROVINCIAL ECONOMIES

Figure 7-1 shows the economic structure of the different provincial economies. The map illustrates that, in general, Canada's eastern provinces have a relatively high share of financial and other services, including government services, and moderate levels of primary commodity production. The provinces of central Canada (Ontario and Ouebec) have economies characterized by high levels of manufacturing and low levels of primary commodity production. In western Canada. Alberta, Saskatchewan and the Territories (Yukon and Northwest) are more dependent on primary commodity production, such as oil, grain, and mining, while the economies of British Columbia and Manitoba are more balanced. despite their moderate levels of primary commodity production activities.

Table 7-1 demonstrates that, in 1997, the four eastern provinces continued to lag behind central and western Canada in annual

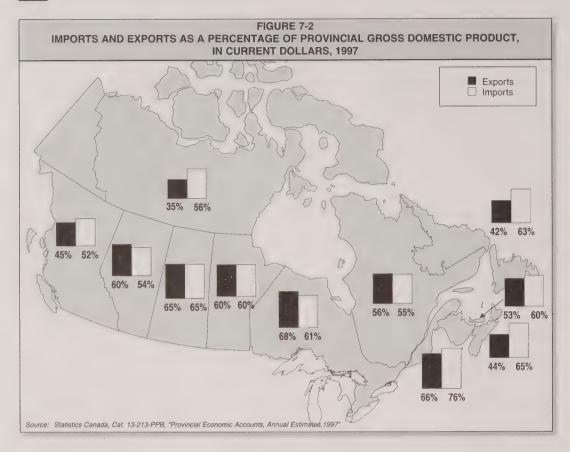
growth, although Prince Edward Island's and Nova Scotia's economies grew more than New Brunswick's and Newfoundland's. In central Canada, Quebec's economy also underperformed the national average, while Ontario's exceeded it, thanks to robust expansion in its manufacturing and construction sectors. Manitoba's, Saskatchewan's and Alberta's economies had the highest growth rates in the country, also driven largely by manufacturing and construction. The economy of British Columbia, Canada's western-most province, trailed the national average due to continuing recession in Japan, a trend accentuated during 1998 by the onset of the Asian financial crisis.

#### TRADE IN PROVINCIAL **ECONOMIES**

Figure 7-2 depicts every province's total international plus interprovincial imports and exports in 1997 as a percentage of provincial gross domestic product (PGDP). The four Eastern provinces—Newfoundland, Nova

Scotia, Prince Edward Island and New Brunswick - each show a trade deficit, reflecting their reliance on a large share of imports. In central Canada, both Ouebec and Ontario had trade surpluses (one per cent of GDP in Quebec, seven per cent in Ontario) with Ontario having the highest share among all the provinces of exports as a percentage of GDP (68 per cent), In Western Canada, Manitoba and Saskatchewan enjoyed balanced trade, with Alberta showing a trade surplus of six per cent of GDP. British Columbia and the Territories suffered trade deficits: seven and 21 per cent, respectively. In both economies, export share was low as a percentage of GDP, again possibly due to continuing economic problems in Asia.

In terms of trade growth, Table 7-2 reveals that both imports and exports grew faster than the provincial economies (see Table 7-1) in every province except Alberta, where export growth lagged the rapid growth of its other sectors. Prince Edward Island was the only province



whose export growth exceeded growth in imports.

#### THE VALUE-ADDED OF COMMERCIAL TRANSPORTATION

Figure 7-3 depicts each province's share of commercial transportation. In eastern Canada, four factors contribute to high shares of commercial transportation as a portion of each province's PGDP. The first is their distant location from markets in central Canada. The second factor is the geographic dispersion of

their populations. The third is their high share of imports, and the fourth factor, their moderate levels of primary commodity production.

New Brunswick, the eastern province closest to both central Canada and the US, is the Atlantic provinces' gateway for road and rail transportation to and from these locations. Consequently, a number of large transportation firms have headquartered their operations in New Brunswick, giving it a higher share of commercial transportation than Newfoundland and Nova Scotia, (but not necessarily Prince Edward Island'). In fact, New Brunswick

has the third-highest share of commercial transportation in Canada, after Prince Edward Island and Manitoba.

Geography influences the importance to each Eastern province of the four transportation modes — rail, road, marine and air. Not surprisingly, marine is the most important mode in the two island provinces, Newfoundland and Prince Edward Island, where it constitutes the largest share of PGDP of all provinces. Newfoundland and British Columbia are the two provinces with the highest share of air transportation. In Nova Scotia and

<sup>6</sup> It is important to note the difficulty in estimating data for small provinces such as Prince Edward Island (P.E.I.). The data presented for P.E.I. and other small populations (such as the Territories) should be viewed with caution, particularly as 1997 data represent a major historical data revision by Statistics Canada.

New Brunswick, truck transportation is the dominant mode, with New Brunswick's gateway position making truck transportation more important to it than to any other province.

In Ontario and Quebec, commercial transportation's contribution to PGDP is relatively low, due to three factors: the first is the low share of primary commodities in the economy; the second, higher population densities; and the third, their proximity to large US markets. In both provinces, the most important mode is trucking, followed by "other transportation," such as urban transit, charter and intercity bus, taxis, travel and tour operators.

The higher levels of commercial transportation seen in western Canada also result from three contributing factors: the provinces' reliance on primary-commodities production, their lower population density, and their greater distance from markets in central Canada. Manitoba, which shares Ontario's western border, is western Canada's gateway for traffic with central Canada. Consequently, Manitoba's commercial-carrier share of PGDP exceeds that of all provinces except Prince Edward Island. Saskatchewan's PGDP also has a large share of commercial transportation, while Alberta<sup>8</sup> has the lowest share of the western provinces. British Columbia's high share results from both its unique geographical position as a province divided from the others by the

ANNUAL COOKER	TABLE 7-2
ANNUAL GROWTH	OF PROVINCIAL IMPORTS AND EXPORTS 1997

(/	Per cent)	
Province/Territory	Exports	Imports
Newfoundland	6.8	9.1
Prince Edward Island	17.1	5.1
Nova Scotia	5.5	10.5
New Brunswick	3.8	5.3
Quebec	5.2	7.1
Ontario	9.0	13.5
Manitoba	10.3	10.5
Saskatchewan	6.2	9.5
Alberta	5.1	13.1
British Columbia	4.8	10.9
Territories	-9.1	13.5
Source: Statistics Canada, Cat. 13-213-PPB, Pro	vincial Economic Accounts, Annual Est	timates, 1997

Rocky Mountain barrier, and its role as a transportation gateway to Pacific Rim countries. The Territories' dispersed population and isolation from southern Canada have also made commercial transportation an important contributor to their PGDP.

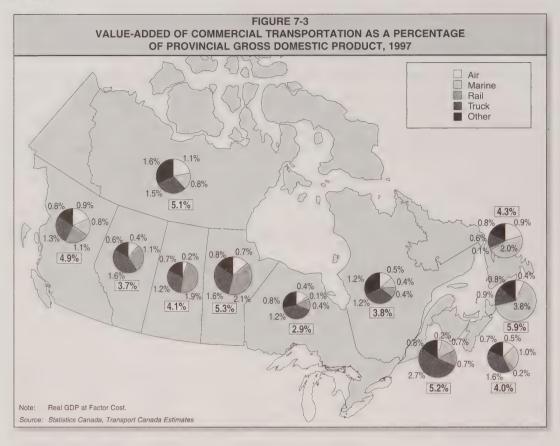
Overall, rail is the most important transportation mode in terms of modal contributions to the western provinces' PGDP, particularly in Manitoba and Saskatchewan, where trucking comes in second to rail. In fact, Manitoba's share of rail as a percentage of PGDP exceeds that of all other provinces. In Alberta and British Columbia, the reverse is true: trucking makes the dominant contribution to the commercial transportation component of PGDP, followed by rail. In the Territories, "other transportation" dominates, followed by trucking and air. Air

transportation contributes a higher share to the PGDP of the Territories than is the case in any other province.

Table 7-3 illustrates annual growth in commercial transportation in 1997. In eastern Canada, commercial transportation growth exceeded PGDP growth in Nova Scotia and New Brunswick, and was less than PGDP growth in Newfoundland and Prince Edward Island. The fastest-growing modes were air in P.E.I. and New Brunswick, rail in Newfoundland, and marine in Nova Scotia. In all four provinces, growth rates for "other transportation" declined.

In Quebec and Ontario, commercial transportation growth exceeded PGDP growth. The highest growth rates were for trucking in Ontario, and marine in Quebec, with "other transportation" declining in both provinces.

- 7 "Other transport" refers to urban transit, charter and intercity bus, taxis, travel and tour operators, and miscellaneous transport.
- 8 The commercial-carrier share of Alberta's economy in particular, but also of Saskatchewan's, will considerably underestimate the importance of transport to these provinces, because the principal and most valuable primary commodities produced (oil, natural gas) are generally transported by pipeline. Pipelines are currently not considered transport by Transport Canada, but will come to be considered transport in 2000, with the advent of North American Industrial Classification System.
- 9 Newfoundland's share of rail, may be somewhat unrepresentative. The province's only railway is located in Labrador. It transports iron ore from Labrador to Quebec for processing on the North shore of the St. Lawrence River. Neither of the island provinces of Newfoundland and Prince Edward Island have railways.

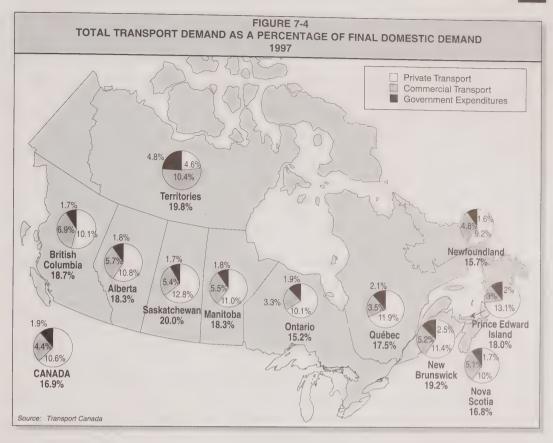


(Per cent)											
Province/Territory	Air	Marine	Rail	Truck	Other	Transport	GDF				
Newfoundland	5.4	0.6	40.0	-3.9	-6.8	0.0	1.8				
Prince Edward Island	9.2	3.4	0.0	0.0	-4.7	1.4	1.9				
Nova Scotia	4.9	13.6	5.9	7.9	-11.7	4.8	2.0				
New Brunswick	16.0	-3.3	3.4	4.2	-10.5	0.8	0.7				
Quebec	3.3	13.6	0.2	8.3	-4.4	3.0	2.				
Ontario	8.1	-5.4	. 7.7	12.5	-0.1	6.9	4.				
<i>M</i> anitoba	7.7	0.0	6.2	3.6	-5.9	3.5	4.				
Saskatchewan	8.5	0.0	12.1	6.7	3.4	8.7	6.				
Alberta	13.2	0.0	21.8	11.4	2.6	12.8	7.				
British Columbia	2.1	-1.8	7.6	4.7	-2.4	2.5	2.3				
Northwest Territories	7.8	-13.8	0.0	9.1	-1.8	1.2	-0.				

Statistics Canada, Cat. 13-213-PPB, Provincial Economic Accounts, Annual Estimates, 1997

TABLE 7-3

Commercial transportation growth exceeded PGDP growth in British Columbia, Alberta, and Saskatchewan, but not in Manitoba and the Territories. Rail topped the growth figures in Saskatchewan, Alberta and British Columbia, while air dominated growth in Manitoba, and trucking led growth in the Territories. "Other transportation" declined as a contributor to PDGP in Manitoba, British Columbia and the Territories.



## TOTAL TRANSPORTATION DEMAND

The first sections of this chapter used "value-added" as an indicator of the importance of transportation to the provinces' economies, a concept tied to a "supply" perspective. This section and the following one on investment use an indicator of the demand for "total transportation." This latter indicator defines transportation more broadly by including three

factors: private spending on transportation <sup>10</sup> (such as consumer purchases of cars); government expenditures on transportation <sup>11</sup> (such as highway maintenance and construction); and sales of commercial carriers <sup>12</sup> (such as the purchases of any commercial transportation carrier's services).

"Total transportation demand" <sup>13</sup> refers to purchases of transportation by consumers, businesses, and governments

located within a province. Total transportation demand can be compared with "provincial final domestic demand (PFDD)," defined as the total value of all goods and services sold in the provincial economies in one year.

The main difference between "commercial transportation value-added" and "commercial transportation demand" lies in the trade balance, where Canada runs a substantial trade deficit in air and

- 10 "Private transportation sales" refer to retail sales to consumers, businesses and government. They are calculated as the sum of retail sales by automobile dealers, gas stations, and automobile parts and repair shops.
- 11 Government expenditures are estimated net of direct fees for services. Direct fees are distinguished from indirect fees, such as fuel-excise taxes, which form part of general government revenues.
- 12 This definition of "commercial carriers" differs from that used in the section on value-added, principally because it excludes "other transport."
- 13 "Total transport demand" combines the intermediate- and final-demand goods and services, and should not be confused with the standard macro-economic concept of final demand. Because of this combination, this definition contains considerable double-counting, and will thus overestimate the importance of transport demand as a proportion of final domestic demand.

TABLE 7-4
ANNUAL GROWTH IN TOTAL TRANSPORTATION DEMAND
1997

		1007			
		(Per cent)			
Province/ Territory	Private Transportation	Commercial Transportation	Government Expenditures	Transportation Demand	Domestic Demand
Newfoundland	9.4	11.7	10.9	10.3	3.7
Prince Edward Island	11.8	-6.3	21.5	9.9	(1.5)
Nova Scotia	8.2	15.4	4.7	9.9	6.1
New Brunswick	6.0	8.4	1.7	5.9	1.1
Quebec	12.1	8.5	0.1	9.7	3.1
Ontario	6.9	10.8	1.2	6.9	6.1
Manitoba	12.8	14.7	0.4	11.9	5.0
Saskatchewan	25.6	12.7	8.5	20.1	8.7
Alberta	20.5	15.6	19.3	18.8	11.1
British Columbia	4.2	6.8	(8.1)	3.9	4.7
Territories	31.2	14.7	10.6	10.9	4.5
Source: Statistics Canada, Transpor	rt Canada Estimates				

marine transportation, and a smaller surplus in land transportation (such as trucking). This is because Canadians' demand for commercial transportation is somewhat higher than what is measured under the value-added concept, given that they consume more air and marine transportation supplied by carriers based outside Canada than from Canadian-based carriers.

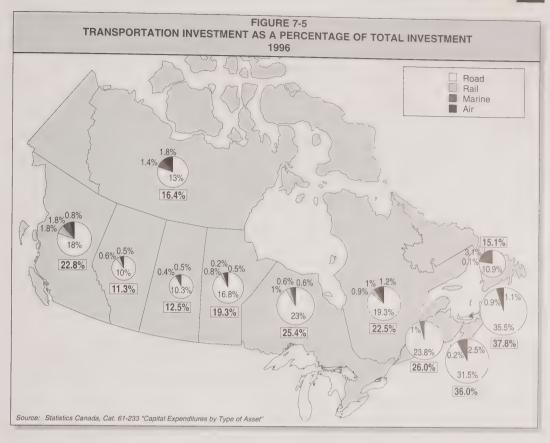
Figure 7-4 shows the proportion of total transportation demand as a portion of provincial final domestic demand. (A table with a more detailed breakdown of total transportation demand can be found in Appendix 7-1a.) The most interesting observation is that private transportation makes up the largest segment of total transportation demand in all provinces, but not in the Territories. The second-largest component of transportation demand in all provinces (and the largest in the Territories) is commercial transportation. Government spending on transportation forms the smallest component of total transportation demand in all provinces and the Territories.

The distribution of total transportation demand distribution in eastern, central and western Canada again indicates higher total transportation demand in eastern and western Canada, except for Newfoundland and Nova Scotia. In these provinces, lower spending on private transportation leads to a proportionately lower share of total transportation within the PFDD. Among the provinces, total transportation demand contributed most to the PFDD in Saskatchewan, closely followed by the Territories. The province with the smallest share is Ontario.

Proportional to PFDD, private transportation spending is highest in Prince Edward Island, with Saskatchewan coming in second. The Territories have the lowest share of private transportation, but the highest share of commercial transportation. Commercial transportation provides the nextlargest share in British Columbia. The Territories also have the largest share of government expenditures, followed by New Brunswick. Newfoundland has the lowest share of government expenditures on private transportation.

Table 7-4 illustrates that in 1997, total transportation demand outgrew domestic demand in all provinces and the Territories, with the exception of British Columbia, where domestic demand growth surpassed the one of transportation. The highest growth was in Saskatchewan and Alberta. the lowest in British Columbia. Private transportation demand exceeded growth in domestic demand in all provinces except British Columbia. Again, growth was fastest in Saskatchewan and Alberta, and slowest in British Columbia. Commercial transportation growth exceeded domestic demand everywhere but in P.E.I. (which saw a decline). with the highest rates in Alberta and Nova Scotia.

Government expenditures on transportation declined in B.C. and the Territories, and grew by less than domestic demand in Nova Scotia, Quebec, Ontario, Manitoba and Saskatchewan.



#### PROVINCIAL TRANSPORTATION INVESTMENT

"Transportation investment", as defined here, includes both "new transportation infrastructure construction" and "purchases of new transportation machinery and equipment by business and government." This definition excludes repair and maintenance expenditures, which belong under "expenditures on existing infrastructure, machinery and equipment." The analysis of transport investment given here uses the broader definition of total transportation demand (purchases of transportation by consumers,

businesses, and governments located within a province).

Transportation infrastructure investment is broken down by modal activities – that is, into road, rail, marine and air. A more detailed breakdown is found in Appendix 7-2.

Figure 7-5 shows the relative share in 1996 of transportation investment as a portion of total investment (with residential construction extracted). The key observation is the predominance of road transportation investment in all provinces and the Territories.

The provinces with both the largest proportion of their total investment in "transportation" and on "road" are Prince Edward

Island and Nova Scotia. Prince Edward Island's high transportation investment figures reflect construction of the Confederation Bridge linking Prince Edward Island to the mainland (construction having been completed in 1997). Alberta and Saskatchewan made proportionately the lowest investments in both transportation and road investment. These low levels are explained by the capital intensity of primary commodity production (oil, grain), with the economies of both Alberta and Saskatchewan heavily dependent on primary commodities. The relative importance of other transportation investment is primarily determined by geography, with Newfoundland



and Nova Scotia having the highest shares of marine, British Columbia the highest share of rail, and the Territories the highest share of air investment.

## APPENDIX 7-1a TOTAL TRANSPORT DEMAND, 1997 AS A PERCENTAGE OF FINAL DOMESTIC DEMAND

						(Pi	er cen	t)									
Province/ Territory			rate ortation	)	Commercial Transportation					Government Expenditures				Total	Government Revenues		
	VEHICLE DEALERS	GASOLINE STATIONS	PARTS AND REPAIRS	(1) TOTAL PRIVATE	AIR	MARINE	PAN	TRUCK	(2) TOTAL COMMERCIAL	ROAD- RELATED	URBAN TRANSIT	OTHER TRANSPORTATION	(3) TOTAL SPENDING	TRANSPORTATION DEMAND (1+2+3)	FUEL TAXES	LICENCE FEES	(4) TO REVE
Newfoundland	6.0	1.8	1.4	9.2	2.8	0.6	0.1	1.3	4.8	1.6	0.0	0.6	2.2	16.3	1.3	0.4	1 1.
Prince Edward Island	7.1	4.4	1.7	13.1	1.1	0.1	0.0	1.7	3.0	2.4	0.0	0.5	2.9	19.0	1.8	0.3	2.
Nova Scotia	6.6	1.9	1.5	10.0	1.3	1.3	0.7	1.9	5.1	1.3	0.2	0.3	1.8	16.9	1.2	0.2	1.
New Brunswick	8.0	1.7	1.7	11.4	0.9	0.9	0.7	2.8	5.2	2.4	0.0	0.6	3.1	19.7	1.3	0.4	1.
Quebec	8.0	1.9	2.0	11.9	1.1	0.5	0.4	1.5	3.5	1.4	0.4	0.4	2.2	17.6	1.5	0.7	2.
Ontario	6.6	1.9	1.6	10.1	1.3	0.1	0.4	1.4	3.3	1.3	0.4	0.3	2.0	15.4	1.2	0.2	1.
Manitoba	7.3	2.2	1.5	11.0	2.0	0.0	1.1	2.4	5.5	1.4	0.2	0.4	2.0	18.5	1.1	0.2	1.
Saskatchewan	7.5	2.1	3.3	12.8	0.8	0.0	2.6	2.0	5.4	1.5	0.1	0.4	2.0	20.2	1.9	0.3	2.
Alberta	7.2	2.0	1.6	10.8	1.9	0.0	1.2	2.6	5.7	1.5	0.2	0.4	2.1	18.6	0.9	0.2	1.
British Columbia	6.5	2.1	1.5	10.1	1.8	1.3	2.1	1.7	6.9	1.1	0.3	0.3	1.7	18.7	0.8	0.3	1.
Territories	3.1	0.9	0.7	4.6	8.2	0.1	0.1	1.9	10.4	2.3	0.0	2.1	4.4	19.4	0.7	0.1	0.

Source: Statistics Canada, Transport Canada Estimates

#### APPENDIX 7-1b ANNUAL GROWTH TOTAL TRANSPORT DEMAND, 1997

			10	1 PCL	Ina	4356	)ILI	D [ 191	AND,	1997							
						(Pe	er cen	t)									
Province/ Territory	Private Transportation			Commercial Transportation						overni xpendi		Total	Government Revenues				
	VEHICLE DEALERS	GASOLINE STATIONS	PARTS AND REPAIRS	(1) TOTAL PRIVATE	AIR	MARINE	RAIL	TRUCK	(2) TOTAL COMMERCIAL	ROAD- RELATED	URBAN TRANSIT	OTHER TRANSPORTATION	(3) TOTAL SPENDING	TRANSPORTATION DEMAND (1+2+3)	FUEL TAXES		(4) TOTAL REVENUES
Newfoundland	22.9	-19.9	9.4	9.4	12.1	14.9	5.0	10.2	11.7	19.8	-2.2	-8.4	10.9	10.3	8.4	3.9	7.3
Prince Edward Island	21.1	3.7	0.0	11.8	16.0	-18.4	0.0	-14.0	-6.3	22.2	0.0	18.4	21.5	9.9	47.1	10.9	40.5
Nova Scotia	13.6	-17.6	31.6	8.2	11.5	20.3	10.8	16.8	15.4	5.8	2.4	1.8	4.7	9.9	1.3	-8.0	-0.1
New Brunswick	12.5	-5.9	-7.6	6.0	23.3	-8.6	-12.4	17.3	8.4	1.7	14.2	1.0	1.7	5.9	-0.7	-0.2	-0.6
Quebec	16.4	-4.3	13.7	12.1	9.8	-4.4	5.7	13.8	8.5	0.0	-1.5	2.4	0.1	9.7	5.5	22.0	10.1
Ontario	8.4	-0.4	10.0	6.9	14.9	4.6	12.4	7.2	10.8	0.7	6.8	-3.2	1.2	6.9	3.2	0.3	2.7
Manitoba	20.5	-1.4	2.3	12.8	14.5	30.2	14.3	15.0	14.7	2.7	-2.2	-6.5	0.4	11.9	6.2	-6.0	4.0
Saskatchewan	14.7	-7.0	123.8	25.6	15.3	0.0	20.5	2.8	12.7	7.1	-2.2	16.7	8.5	20.1	2.2	4.0	2.5
Alberta	21.5	17.2	20.3	20.5	20.3	0.0	5.7	17.2	15.6	21.8	3.8	19.9	19.3	18.8	1.6	6.7	2.6
British Columbia	-0.1	13.2	12.5	4.2	8.6	-3.9	9.2	11.4	6.8	-9.5	0.6	-8.4	-8.1	3.9	-5.2	0.8	-3.6
Territories	33.0	20.7	37.3	31.2	14.6	402.5	19.0	9.1	14.7	-11.5	-2.2	-9.6	-10.6	10.9	4.0	16.4	6.0

Source: Statistics Canada, Transport Canada Estimates



British Columbia

Territories

#### **APPENDIX 7-2** INVESTMENT IN TRANSPORTATION AS A PERCENTAGE OF TOTAL INVESTMENT, 1996

(Per cent) Province/Territory Total Transportation Road Rail Marine Air TOTAL STRUCTURE MACHINERY STRUCTURE MACHINERY TOTAL STRUCTURE MACHINERY TOTAL STAUCTURE MACHINERY STRUCTURE MACHINERY TOTAL TOTAL Newfoundland 15.1 6.6 8.5 10.9 5.4 5.5 0.1 0.1 0.0 3.1 1.0 2.0 0.0 0.0 0.0 Prince Edward Island 37.8 33.0 4.7 35.5 32.4 3.1 0.0 0.0 0.0 0.9 0.2 0.7 1.1 0.0 1.1 Nova Scotia 36.0 7.1 28.9 31.5 5.8 25.8 0.2 0.2 0.0 2. 1.1 1.4 0.0 0.0 0.0 6.6 New Brunswick 26.0 7.6 0.0 0.0 1.0 18.3 23.8 17.2 0.0 0.8 0.2 0.0 0.0 0.0 Quebec 22.5 7.3 15.2 19.3 6.4 13.0 0.9 0.3 0.5 1. 0.5 0.5 1.2 0.1 1.1 Ontario 25.4 5.9 19.5 23.0 4.8 18.2 1.0 0.5 0.5 0.6 0.4 0.2 0.6 0.0 0.6 Manitoba 19.3 5.9 13.4 16.8 5.1 11.7 0.5 0.5 0.0 0.2 0:2 0.1 0.8 0.1 8.0 Saskatchewan 2.1% 0.1 12.5 3.2 9.3 10.3 8.2 0.0 0.0 0.0 0.4 0.4 0.0 0.5 0.4 Alberta 11.3 2.4 8.9 10.0 2.0 8.0 0.6 0.3 0.3 0.1 0.0 0.0 0.5 0.0 0.5

1.8

0.0

1.1

0.0

0.8

0.0

1.8

1.4

0.9

1.0

0.9

0.4

0.8

1.8

0.0

1.0

0.8

0.9

12.3 Source: Statistics Canada, Cat. 61-223, "Capital Expenditures by Type of Asset, 1996"

9.0

13.8

4.1

18.0

12.9

6.8 11.3

10.2

2.7

22.8

16.4

# TRANSPORTATION AND EMPLOYMENT

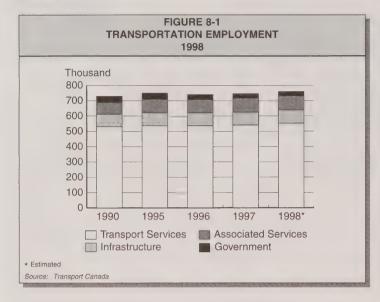
Transportation contributed directly to more than 730,000 jobs in 1998, or 6.4 per cent of total employment in Canada.

Transportation is an important contributor to employment in Canada. Transport Canada estimates indicate that, this sector continues to directly account for 6.4 per cent of total employment in this country.

This chapter looks at three specific areas: first, the number of people whose jobs are directly tied to the transportation sector; second, the average annual salary earned by transportation employees; and third, a brief look at labour relations in the transportation sector.

The overall picture presented here is incomplete in some areas, primarily due to a lack of data for such information as the numbers of municipal employees working in transportation-related jobs, federal and provincial employees in traffic enforcement, federal employees in customs, and so on. This lack of data makes it difficult to compare across modes on an area-by-area basis. Timeliness of data is another serious shortcoming, as it affects the ability to include current data and related modal comparisons. In addition, for the purposes of this report, "soft" figures were not

used. In many cases, the missing information is a result of datareporting procedures that are in flux due to changes in jurisdiction. For example, statistics formerly gathered and reported by a federal organization have recently been devolved to a different level of government or the private sector. As new reporting procedures develop, and as additional and new sources are explored, it is hoped that many of the "missing pieces" can be filled in, leading to more comprehensive analyses in future editions of Transport Canada's annual report.



This chapter only includes jobs directly associated with transportation. It does not cover employment in areas such as manufacturing (of vehicles, signs and other transport-related products), the service sector (motels, restaurants and other services) or other areas that exist only or partially because the transportation sector needs them.

#### WORKFORCE

#### **OVERVIEW**

In 1998, an estimated 730,000 people worked full-time in the transportation sector, accounting for 6.4 per cent of the share of total employment. It must be emphasized that due to the lack of current data for most areas covered in this chapter, the 1998 figure is a broad estimate developed by Transport Canada.

In 1997, the sector's share of total employment was also 6.4 per cent; in 1996 it was 6.5 per cent; and in 1995 it was 6.7 per cent. Five years earlier, in 1990, the share was an estimated 6.2 per cent.

Jobs directly associated with transportation can be broken down into the following employment categories:

- transport services
- transportation infrastructure
- government services tied to transportation, and
- "other" associated services.

Within the sector as a whole, transport services account for the greatest proportion of jobs. In 1998, an estimated 524,000 employees (71.6 per cent) worked directly in the delivery of transport services such as air, marine, rail, truck and bus carriers' operations. Associated services, such as marine pilotage, travel agencies and tour operators, accounted for 92,000 jobs (12.6 per cent), while jobs related to development and maintenance of infrastructure made up

87,000 positions (11.9 per cent). Transport-related jobs in the federal, provincial and local governments accounted for the remaining positions (3.9 per cent).

Figure 8-1 shows estimated full-time employment levels, by each of the four categories of interest, from 1990 to 1998.

Table 8-1 shows the number of people employed full-time in various modes in transportation-related positions in four categories: transport services, transport infrastructure, government services and associated services.

The trucking industry alone is an important employer in the transportation sector, accounting for an estimated 41.1 per cent of full-time jobs in 1998. Air is the second-largest employer, with an estimated 15.1 per cent of all jobs. It must be emphasized that the figures in Table 8-1 are related only to direct full-time employment. Jobs that partially serve the needs of these modes, such as employment at hotels, motels and restaurants, among others, have not been included.

This report also excludes a regional employment summary, due to numerous data gaps. Wherever possible, however, regional breakdowns are provided in individual chapter sections. Transport Canada intends that additional information concerning regional employment will become available over the next year, allowing for a more comprehensive regional breakdown in the 1999 annual report.

### TRANSPORT SERVICES Rail

Rail transport services discussed here include personnel such as engineers and conductors, who provide rail transportation services directly, and workers who carry out equipment maintenance. The discussion also includes estimates of carrier managerial and administrative staff allocated to transportation services. The most recent year for which this level of information is available is 1997.

An estimated 32,956 personnel provided transportation, equipment maintenance and related administrative rail services in 1997, accounting for 71.0 per cent of all employment in the rail industry. Of this total, 17,660 personnel (54 per cent) were directly involved in transportation, while 10,464 workers (32 per cent) were involved in equipment maintenance.

Since 1990, employment in rail transport services has fallen by 33 per cent. Those involved with equipment maintenance were the most affected, with a 43 per cent decrease in employment between 1990 and 1997.

Carriers may contract out some work related to equipment maintenance, although the number of employees associated with contract work is not known at this time. Continued research over the next year may allow for a better estimate of this component.

Table 8-2 shows employment distribution in rail transport services.

The share of employment associated with rail transportation services, when compared with total rail employment, including incidental services, has been

### TABLE 8-1 TRANSPORTATION EMPLOYMENT BY CATEGORY

(In	thousands	of worker	s)		
	1990	1995	1996	1997	1998(e)
Transport Services					` /
Air¹	68.0	61.0	61.0	70.0	77.0
Marine <sup>2</sup>	30.0	28.0	23.0	20.7	19.0
Rail <sup>3</sup>	49.2	36.8	34.1	33.0	32.0
Truck⁴	253.9	286.3	294.1	296.6	300.9
Bus/Urban Transit⁵	69.2	60.9	59.1	57.8	57.8
Local Services <sup>6</sup>	31.2	· 34.7	35.5	36.4	37.3
Total (e)	501.5	507.7	506.8	514.5	524.0
Transport Infrastructure					
Air <sup>7</sup>	n/a	n/a	n/a	n/a	2.7
Marine <sup>8</sup>	1.2	1.6	1.7	1.6	1.5
Rail®	19.9	14.9	13.9	13.9	13.9
Highway <sup>10</sup>	60.0	68.0	68.8	68.8	68.8
Total (e)	81.1	84.5	84.4	84.3	86.9
Government Services <sup>11</sup>	40.7	40.0	32.1	29.1	28.4
	40.7	70.0	32.1	23.1	20.4
Associated Services:					
Air <sup>12</sup>	21.0	30.0	29.5	30.5	30.5
Marine <sup>13</sup>	8.5	8.5	8.2	8.5	8.5
"Other" Services <sup>14</sup>	47.4	50.7	50.1	53.3	53.2
Total (e)	76.9	89.2	87.8	92.3	92.2
GRAND TOTAL (e)15	700.2	721.4	711.1	720.2	731.5

Note: Due to confidential data which has only been included in the grand total, the individual sections do not necessarily add up to the sum given for the grand total.

n/a: not available; e: estimate by Transport Canada

#### Sources.

- 1998 based on first nine months' data; Statistics Canada Survey of Employment, Payroll and Hours
- 2 1990-Statistics Canada SEPH; 1995 to 1998 Transport Canada estimates
- 3 Transport Canada estimates
- 4 Statistics Canada, Cat. 53-222-XPB, Census; Statistics Canada Survey of Employment, Payroll and Hours (SEPH); Transport Canada
- 5 1990–1996 Statistics Canada Cat. 53-215, 1997–1998 Transport Canada estimate. May include part-time employees in school bus operations as well as charter bus operations
- 6 1991 & 1996 Census data; 1990, 1995, 1997, 1998 Transport Canada estimates
   7 Canadian Airport Authorities
- 8 St. Lawrence Seaway Authority, Statistics Canada Cat. 54-205, Proposed Canadian Port Authorities. 1990 does not include Seaway data. Ports: 1990–1997 CPC ports data; 1998 data reflects proposed Canadian Port Authorities
- 9 Transport Canada estimates based on Statistics Canada Cat. 52-216
- 10 Transport Canada based on 1986, 1991 and 1996 Census data
- 10 Transport Cartada based on 1986, 1991 and 1990 Census data 11 1990, 1997 and 1998 include estimates of 20,000 for provincial and termorial employment. Source: Government Estimates
- 12 Statistics Canada, Annual Survey of Travel Agents and Tour Guides
- 13 Pilotage Authorities, Statistics Canada Census
- 4 Insurance Bureau of Canada, Statistics Canada Census
- 15 Excludes part-time employees. Unfortunately, part-time data was available only in 1991 for Urban Transit (1,223 employees); in 1995 for Urban Transit and Small For-Hire carries (13,849 employees), and in 1996 for Urban Transit. Small For-Hire carriers and Owner-Operators carriers (30,632 employees).

TABLE 8-2 EMPLOYMENT BY RAIL TRANSPORT SERVICES								
1990	Total Rail¹	Transport Services	Per Cent of Total <sup>2</sup>	Class I	Class II & III			
General <sup>3</sup> Transportation Equip. Maintenance Total	69,119	7,100 23,598 18,477 <b>49,175</b>	71.1	6,510 20,819 16,618 <b>43,947</b>	590 2,779 1,859 <b>5,228</b>			
1995 General³ Transportation Equip. Maintenance Total	51,754	5,706 19,719 11,405 <b>36,830</b>	71.2	5,274 17,676 10,243 <b>33,193</b>	432 2,043 1,162 <b>3,637</b>			
1996 General <sup>3</sup> Transportation Equip. Maintenance Total	48,038	5,039 18,206 10,886 <b>34,131</b>	71.1	4,627 16,225 9,757 <b>30,609</b>	412 1,981 1,129 <b>3,522</b>			
1997 General <sup>3</sup> Transportation Equip. Maintenance Total	46,402	4,852 17,660 10,464 <b>32,976</b>	71.0	4,475 15,684 9,352 <b>29,511</b>	357 1,976 1,112 <b>3,445</b>			

1 "Total Rail" employment limited to carrier personnel (does not include incidental rail services).

2 Total transport services as a percentage of total rail employment

3 Estimated number of managerial and administrative personnel allocated to transportation

Source: Statistics Canada Cat. 52-216: Transport Canada

TABLE 8-3 TOTAL EMPLOYMENT BY RAIL TRANSPORTATION SERVICES								
	Transport Services	Per Cent of Total	Rail Carrier <sup>1</sup>	Per Cent of Total	Total <sup>2</sup>			
1990	49.2	71.3	69.1	100	69.0			
1995	36.8	69.4	51.8	97.7	53.0			
1996	34.1	66.9	48.0	94.1	51.0			
1997	32.7	67.3	46.4	94.7	49.0			
1998	32.0 est.	66.7	42.0 est.	n/a	48.0*			

\* Preliminary data based on first three quarters of 1998; Statistics Canada SEPH

Est.: Transport Canada n/a: not available

Source: 1 — Statistics Canada, Cat. 52-216
2 — Statistics Canada, Statistics Canada Survey of Employment, Payrolls and Hours

steadily decreasing since 1990. A similar pattern is evident in total carrier employment, which suggests that employment related to incidental services2 has increased slightly over the last decade.

Table 8-3 shows the total estimated full-time employment figures by rail transportation services.

#### Trucking

#### For-Hire Trucking Firms

For-hire trucking firms3 employed an estimated 31 per cent of all personnel engaged in trucking activity in Canada in 1997. In addition to their company employees, for-hire trucking firms also contracted 26.588 owneroperators over the course of the year.4

The average number of company drivers decreased slightly in 1997, but continued to account for 55.9 per cent of total company employees. Since 1991, the ratio of company drivers to total employees has remained relatively stable at between 55 and 60 per cent.

The average number of company drivers increased by almost 23 per cent from 1991 to 1997, despite a 1.1 per cent decrease in drivers in 1997 over 1996 levels. The numbers of other company employees increased by 30.8 per cent over the same period.

For-hire trucking firms are continuing to rely increasingly on the services of owner-operators. Between 1991 and 1997, the number of owner-operators used by for-hire trucking firms increased by 42 per cent.

- Incidental services: jobs which are associated with the rail industry, but are not defined in Statistics Canada, Cat. 72-002.
- Includes Canadian domiciled for-hire carriers with annual revenues of \$1 million or more.
- These owner-operators may also have been providing services to small for-hire and private carriers. An owner-operator may repesent more than one employee.

Table 8-4 gives employment figures showing employment by for-hire trucking firms.

In 1997, the highest level of employment by for-hire carriers was in Ontario, accounting for 41.4 per cent of total company employees in this category. Over 24 per cent were employed on the Prairies, and 19 per cent in Ouebec. Carriers in Ontario also accounted for 41 per cent of company drivers. and 43 per cent of all "other" company employees, such as those working in garages or terminals, or as maintenance workers.

Ontario-based carriers were also the largest users of owner-operators, accounting for 39 per cent of the total owner-operators employed by for-hire carriers in Canada. Medium and large carriers based in the Prairie Provinces accounted for 27.1 per cent of owner-operators used, while an additional 15 per cent were from Quebec-based carriers.

Table 8-5 gives the regional distribution of employment by forhire trucking firms.

#### Small For-Hire Carriers

In 1996, an estimated 8,140 small for-hire carriers5 reported

TABLE 8-4	
EMPLOYMENT	
BY FOR-HIRE TRUCKING	FIRMS1

BT FOR-HIRE TRUCKING FIRMS							
	Company Drivers	Other Employees <sup>2</sup>	Total Company Employees				
1991	41,725	30,892	72,617				
1995	50,323	39,963	90,286				
1996³	51,833	37,182	89,015				
1997³	51,256	40,397	91,653				

- 1 Includes Canadian-domiciled for-hire carriers with annual revenues of \$1 million or more
- 2 Other Employees: maintenance and garage, terminal and other employees 3 1996/1997: annual figures are an average of quarterly data for each year Other Employees: maintenance and garage, terminal and other employees

Source: Statistics Canada Cat. 53-222-XPB

35,754 full- and part-time employees across Canada. In addition, these companies used the services of 3,490 owner-operators<sup>6</sup> on a full- and part-time basis. The largest number of company employees, 35 per cent, worked for carriers based in Ouebec. Contracts to owner-operators were most predominant in Ontario, followed closely by companies located in the Prairie Provinces.

Small for-hire firms employed 24,344 full- and part-time drivers throughout Canada in 1996, accounting for 68 per cent of company employees. The largest concentration of company drivers was in Quebec (37 per cent) and Ontario (23 per cent).

Total employment by small forhire firms increased by more than 10 per cent in 1996, despite only a two per cent increase in the estimated number of companies. The use of full-time owneroperator services also increased significantly (more than 69 per cent), from 1,594 in 1995 to 2,695 in 1996. Employment of part-time owner-operator services decreased from 2,586 in 1995 to 795 in 1996.

The number of company drivers (full- and part-time) increased by 3.6 per cent in 1996. The use of full-time drivers jumped from 17,403 in 1995 to 19,197 in 1996, while the number of part-time drivers decreased by 16 per cent.

### TABLE 8-5 EMPLOYMENT BY MEDIUM AND LARGE FOR-HIRE TRUCKING FIRMS BY REGION

		1997					
	Canada	Atlantic Region	Quebec	Ontario	Prairie Provinces	British Columbia	Territories
Company Drivers	51,256	3,100	10,519	20,779	12,520	4,238	100
Other Company Employees	40,397	3,467	6,858	17,209	9,728	3,006	129
Total Company Employees	91,653	6,567	17,377	37,988	22,248	7,244	229

Notes:

Includes Canadian domiciled for-hire trucking firms with annual revenues of \$1 million or more

Other Employees: maintenance and garage, terminal and other employees 1997: Annual figures are an average of quarterly data for the year.

Source: Statistics Canada Cat. 53-222-XPB

- Canadian-based for-hire carriers with operating revenues greater than or equal to \$30,000 and less than or equal to \$999,999.
- Owner-operators may be employed by more than one category of carriers over the course of the year.

TABLE 8-6 EMPLOYMENT BY SMALL FOR-HIRE TRUCKING FIRMS 1995 AND 1996							
	Canada	Atlantic Region	Quebec	Ontario	Prairie Provinces	British Columbia	Territories
1995		J					
Company							
Full-Time	22,588	1,944	6,115	6,086	4,528	3,879	36
Part-Time	9,800	649	3,369	2,889	1,796	1,089	7
1996							
Company							
Full-Time	26,353	1,667	9,586	6,044	5,293	3,733	30
Part-Time	9,401	779	2,917	2,607	1,636	1,446	16
Source: Statistics Canada, Cat. 50-002-XPB							

TABLE 8-7 EMPLOYMENT BY PRIVATE CARRIERS 1995 – 1997							
		Atlantic			Prairie	British	
	Canada	Region	Quebec	Ontario	Provinces	Columbia	
1995							
Highway Drivers	6,136	144	1,282	3,511	781	418	
Local Drivers	8,738	334	2,592	3,635	1,233	944	
Other Employees	5,368	169	1,158	2,845	498	698	
Total	20,242	647	5,032	9,991	2,512	2,060	
1996							
Highway Drivers	5,600	189	1,032	3,362	682	335	
Local Drivers	8,087	358	2,468	3,155	1,087	1,019	
Other Employees	6,306	247	1,289	3,152	707	911	
Total	19,993	794	4,789	9,669	2,476	2,265	
1997							
Highway Drivers	4,379	133	1,007	2,364	533	342	
Local Drivers	8,001	433	2,297	2,897	1,257	1,117	
Other Employees	5,212	154	1,596	2,326	469	667	
Total	17,592	720	4,900	7,587	2,259	2,126	
Source: Statistics Canada Cat. 53-222-XF	PB						

TABLE 8-8  NUMBER OF FULL-TIME EMPLOYEES: OWNER OPERATORS  1995 and 1996							
	Canada	Atlantic Region	Quebec	Ontario	Prairie Provinces	British Columbia	Territories
1995 1996	57,335 61,377	5,010 4,684	10,050 10,266	17,420 17,492	15,848 16,256	8,896 12,592	110 86
Source: Statistics Canada Cat. 53-222-XPB							

TABLE 8-9 TOTAL EMPLOYMENT IN THE TRUCKING INDUSTRY								
	Medium and Larg For-Hire	e Small For-hire	Private	Owner- Operator	Sub-Total	Delivery Drivers	Total	
1991	72,617	27,355	27,184	52,000	179,156	90,310	269,466	
1995	90,286	32,388	20,242	57,335	200,251	95,940	296,191	
1996	89,015	35,754	19,993	61,377	206,139	97,400	303,539	
1997	91,654	n/a	17,592	n/a	206,377	98,900	305,277	

Medium and large For-Hire Carriers: Includes Canadian-domiciled for-hire carriers with annual revenues of \$1 million or more Small For-Hire Carriers: Includes Canadian-domiciled for-hire carriers with operating revenues of greater than \$25K and less than \$1 million. Estimated for 1991.

Private Carriers: Includes private carriers with operating expenses of \$1 million or more. Estimated for 1991.

Owner-Operators: Estimated for 1991.

Sub-Total: 1997 includes TC estimate of 35,754 for private carriers and 80,240 owner-operators.

Delivery Drivers: Based on 1991 and 1996 Census data; estimated values for 1995 and 1997.

According to 1996 Census data, there were 227,310 truck drivers in Canada

1991 Est.: by Transport Canada

Source: Statistics Canada Cat. 53-222-XPB, SEPH and Transport Canada

Table 8-6 shows the number of full-time and part-time workers employed by small for-hire trucking firms.

#### Private Carriers

There were an estimated 422 private carriers<sup>7</sup> in Canada in 1997, employing 17,592 people. Total employment by private carriers has decreased by 15 per cent since 1995 even though the number of carriers has remained relatively stable.

The number of highway drivers, in particular, has decreased significantly, from well over 6,000 in 1995 to 4,379 in 1997 (a 29 per cent decrease). Most of this decline was recorded in Ontario, where the numbers of

highway drivers dropped by 30 per cent.

Table 8-7 shows the distribution of employment categories among private carriers.

#### Owner-Operators

In 1996, some 40,090 owner-operators reported 61,377 full-time and 18,863 part-time employees across Canada. Most were employed in Ontario (28.5 per cent), with the Prairies coming a close second (26.5 per cent). Of these employees, 53,785 were drivers, accounting for 88 per cent of total full-time employees. There were also 9,511 part-time drivers, accounting for 50 per cent of the total part-time employees.

Owner-operators across Canada reported a seven per cent increase in the number of full-time employees in 1996. Most of this increase occurred in British Columbia, where the number of employees increased by over 40 per cent.

Table 8-8 sets out the number of full-time owner-operators in 1995 and 1996.

#### Total Trucking Employment

Available information for large and small for-hire carriers, private operators, owner-operators and delivery drivers suggests that the number of individuals employed full and part time in the trucking sector in 1997 was well over 300,000.

<sup>7</sup> Data limited to Canadian domiciled private carriers with operating expenses of \$1,000,000 or more. A private carrier is a company whose principal occupation is not trucking, but maintains its own fleet of vehicles (owned or leased) for transporting its own freight. Response rate for this survey is very low, which may effect data quality.

### TABLE 8-10 EMPLOYMENT BY SCHEDULED INTERCITY BUS OPERATORS

	1990	1995	1996
Drivers	2,457	1,643	1,419
Mechanics	591	242	149
Other	2,062	1,660	1,571
Total	5,110	3,545	3,139

1990: includes companies with operating revenues of \$500,000 or more 1995/1996: includes companies with operating revenues of \$2 million or more

Source: Statistics Canada, Cat. 53-215

### TABLE 8-11 EMPLOYMENT BY SCHOOL BUS OPERATORS

	1990	1995	1996
Drivers	20,544	15,007	13,638
Mechanics	1,198	820	780
Other	1,553	1,663	1,398
Total	23,295	17,490	15,816

1990: includes companies with operating revenues of \$500,000 or more 1995/1996: includes companies with operating revenues of \$2 million or more

Source: Statistics Canada, Cat. 53-215

### TABLE 8-12 REGIONAL DISTRIBUTION OF EMPLOYMENT BY SCHOOL BUS OPERATORS

	Canada	Atlantic and Quebec	Ontario	Western Canada and Territories
	Canada	Quebec	Ontario	and remitories
1990	23,295	5,637	15,814	1,844
1995	17,490	3,012	12,308	2,170
1996	15,816	2,666	10,888	2.262

1990: .includes companies with operating revenues of \$500,000 or more 1995/1996: includes companies with operating revenues of \$2 million or more

Source: Statistics Canada, Cat. 53-215

Table 8-9 shows the distribution of employment among different categories in the trucking industry.

A number of considerations should be taken into account when reviewing these estimates. First, the data for delivery drivers does not include other personnel employed by the company, which introduces underestimation into the overall numbers shown above.

Second, census data for 1996 reported 227,310 truck drivers in Canada. Considering that drivers account for between 55 and 60 per cent of company personnel, the above figures for total trucking employment would appear to be an underestimation.

#### Bus

#### Scheduled Intercity Services

In 1996, 14 large, scheduled intercity bus<sup>8</sup> operators reported that they employed a total of 3,139 people. Forty-five per cent of these employees were drivers, and 5 per cent were mechanics. Administrative staff and terminal and sales personnel made up the remainder. Although 26 small, scheduled intercity operators<sup>9</sup> also filed reports in 1996, employment data are not available for these carriers.

Comparisons over time are difficult in the intercity bus industry, due to changes in coverage by the intercity bus survey. Regional breakouts for employment by the intercity industry are not available.

Table 8-10 shows employment numbers and categories for scheduled intercity bus operators.

#### School Bus Industry

An estimated 676 large school bus companies operated in Canada in 1996. These companies reported that they employed 15,816 people for the year. Of these, over 86 per cent were drivers, with mechanics accounting for five per cent and other staff accounting for nine per cent. A breakout between full- and part-time employees was not possible.

Comparisons over time of employment in this industry are difficult, due to changes in survey coverage.

Table 8-11 shows employment by school bus operators.

Ontario accounted for almost 69 per cent of all employees

- 8 In 1996, large scheduled intercity bus operations included carriers with annual revenues greater than \$2,000,000. Prior to 1995, the survey included carriers with annual revenues greater than \$5,000,000.
- 9 Include those carriers with annual revenues greater than \$200,000 but less than \$2,000,000.

reported by school bus companies across Canada in 1996. Companies in that province also accounted for 69 per cent of all school bus drivers.

Table 8-12 shows the regional distribution of employment by school bus operators.

#### Charter and Other Passenger Bus Industry

An estimated 98 charter and other passenger bus companies reported a total workforce of 3,390 employees in Canada in 1996. Over 52 per cent of these were situated in Ontario. A breakout between full and part-time employees is not possible.

Comparisons over time of employment in this industry are difficult, due to changes in survey coverage.

Table 8-13 shows employment by charter and other passenger bus companies.

Of the 52 per cent of employees located in Ontario in 1996, 72 per cent were drivers, five per cent were mechanics and 33 per cent were administrative and management personnel.

Table 8-14 shows employment by charter and other passenger bus companies, by region.

#### **Local Services**

#### Urban Transit

In 1996, 77 urban transit companies reported a combined workforce totalling 38,425 people. Sixty-one per cent of this total workforce were directly involved in the transportation operations of the companies (for example, as drivers). Only four per cent were part-time employees.

Table 8-15 shows employment by urban transit companies.

# TABLE 8-13 CATEGORY OF EMPLOYMENT FOR CHARTER AND OTHER PASSENGER BUS COMPANIES, 1990 – 1996

	1990	1995	1996
Drivers	2,218	1,720	2,431
Mechanics	215	214	219
Other	390	508	740
Total	2,823	2,442	3,390

1990: includes companies with operating revenues of \$500,000 or more 1995/1996: includes companies with operating revenues of \$2 million or more

Source: Statistics Canada, Cat. 53-215

# TABLE 8-14 CHARTER AND OTHER PASSENGER BUS COMPANIES EMPLOYMENT BY REGION, 1990 - 1996

	Canada	Atlantic and Quebec	Ontario	Western Canada and Territories
1990	2,823	658	1,422	743
1995	2,442	455	1,560	427
1996	3,390	655	1,758	977
1990:	includes companies with operating reve	enues of \$500,000 or	more	

1990: includes companies with operating revenues of \$500,000 or more 1995/1996: includes companies with operating revenues of \$2 million or more Source: Statistics Canada, Cat. 53-215

# TABLE 8-15 EMPLOYMENT BY URBAN TRANSIT COMPANIES 1990 - 1996

	1990	1995	1996
Transport Operations			
Full-Time	23,884	25,447	22,807
Part-Time	300	793	787
Total	24,184	26,240	23,594
Rev. Vehicle Maint.			
Full-Time	7,057	4,786	6,795
Part-Time	240	240	193
Total	7,297	5,026	6,988
Non-Rev. Veh. Maint.			
Full-Time	3,191	3,102	3,136
Part-Time	293	122	150
Total	3,484	3,224	3,286
General & Admin.			
Full-Time	3,810	4,160	4,114
Part-Time	390	308	442
Total	4,200	4,468	4,556
Total			
Full-Time	37,943	37,494	36,852
Part-Time	1,223	1,463	1,573
Total	39,166	38,957	38,425

Source: Statistics Canada, Cat. 53-215

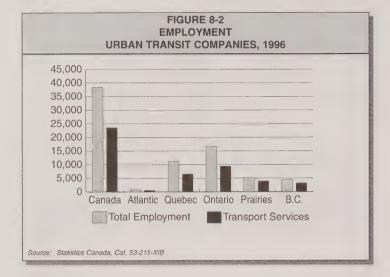


TABLE 8-16 REGIONAL BREAKDOWN OF EMPLOYMENT BY URBAN TRANSIT COMPANIES, 1996						
	Transportation Operations	Per Cent of Total Employment	Total Employment			
Canada Full-Time Part-Time Total	22,807 787 <b>23,594</b>	61.4	36,852 1,573 <b>38,425</b>			
Atlantic Full-Time Part-Time Total	519 33 <b>552</b>	72.4	704 58 <b>762</b>			
Quebec Full-Time Part-Time Total	6,543 11 <b>6,554</b>	58.7	10,810 356 <b>11,166</b>			
Ontario Full-Time Part-Time Total	9,006 370 <b>9,376</b>	56.4	15,980 634 <b>16,614</b>			
Prairies Full-Time Part-Time Total	3,616 304 <b>3,920</b>	73.5	4,956 376 <b>5,332</b>			
British Columbia Full-Time Part-Time Total	3,101 64 <b>3,165</b>	70.1	4,374 144 <b>4,518</b>			
Territories Full-Time Part-Time Total Source: Statistics Canada	22 5 <b>27</b> 1, Cat. 53-215	n/a	28 n/a <b>n/a</b>			

Figure 8-2 shows levels of regional urban transit employment in Canada.

In 1996, 72 per cent of all employees in this industry were located in Central Canada, with Ontario accounting for 43 per cent and Quebec 29 per cent.

Table 8-16 shows the regional breakdown of regional employment by urban transit companies in 1996.

#### Taxi and Limousine Services

According to census data, there were 35,490 taxi and limousine drivers in Canada in 1996, up from 29,950 in 1986, for an 18 per cent increase. Ontario, Quebec and British Columbia accounted for 75 per cent of the 1996 total.

Figure 8-3 shows the number of limousine and taxi drivers, by region, from 1986 to 1996.

Ontario accounted for 40 per cent of all taxi and limousine drivers in Canada in 1996, an increase of 27 per cent over 1986 levels. 24 per cent were employed in Quebec, up ten per cent from 1986, and 12 per cent were employed in British Columbia, up 16 per cent from 1986.

Table 8-17 identifies the number of taxi and limousine drivers employed in each province for 1986, 1991 and 1996.

#### Air

In 1997<sup>10</sup>, 52,896 persons were employed with Level I to IV <sup>11</sup> air carriers, accounting for approximately 75 per cent of all air transport personnel. Total Levels I to III air carrier employment increased by 3.3 per cent, with pilots and copilots (4.3 per cent growth) and other flight personnel (7.3 per cent growth) accounting for most of the increase. Level IV air carrier jobs decreased by 3.9 per cent in 1997.

Level I to III <sup>12</sup> carriers accounted for the highest proportion of total employees, with an estimated 69 per cent of total personnel in 1997. Pilots and copilots made up 14 per cent of Level I to III employees. Other flight personnel comprised 19 per cent, management seven per cent, and other carrier personnel 60 per cent.

Although the total number of other flight personnel dropped significantly between 1990 and 1995, the number increased substantially in 1996 and 1997. The 1997 employment level of maintenance, aircraft, trafficservices and other personnel was 14 per cent below the 1990 level.

Table 8-18 shows the number of people employed by Levels I to IV air carriers between 1990 and 1997.

In 1997, Ontario had the highest percentage of personnel employed by major air carriers<sup>13</sup> (31 per cent), followed by British Columbia (27 per cent) and Quebec (21 per cent).

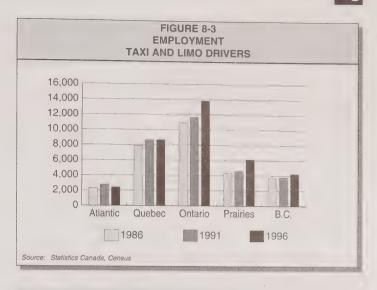


TABLE 8-17 NUMBER OF TAXI AND LIMOUSINE DRIVERS EMPLOYED IN EACH PROVINCE							
1986 1991 1996							
Newfoundland	585	650	655				
Prince Edward Island	N/A	135	150				
Nova Scotia	1,225	1,270	1,100				
New Brunswick	480	700	515				
Quebec	7,890	8,610	8,665				
Ontario	10,890	11,660	13,825				
Manitoba	970	1,090	1,355				
Saskatchewan	650	765	1,040				
Alberta	2,700	2,695	3,710				
British Columbia	3,665	3,750	4,235				
Territories	N/A	185	235				
Canada	29,950	31,510	35,490				
Source: Statistics Canada, Census							

Figure 8-4 shows the number of major air carrier employees, by region, for 1997.

Between 1990 and 1996, Levels I to IV carriers accounted for 83 to 85 per cent of total air-carrier employment. Carriers classified as

Levels V to VI were responsible for the remaining 15 to 18 per cent. In 1997, however, the ratio of Levels I to IV employment dropped to 75.6 per cent, reflecting an apparent increase in the numbers of persons employed by Levels V to VI carriers.

- 10 1997 is the most current year of data available at this level of detail.
- 11 Level I-III: Canadian air carriers that in each of the two calendar years immediately preceding the report year transported 5,000 revenue passengers or more and/or 1,000 tonnes of revenue goods or more.

  Level IV: Canadian air carriers not classified in Levels I-III that, in each of the two calendar years immediately preceding the report year, realized annual gross revenues of more than \$500,000 for air services for which the air carrier held a licence.
- 12 There were 880 Level I–VI air carriers in 1996. Levels I–III: 104: Level IV: 120: Level V: 627: Level VI: 29
  Source: Statistics Canada
- 13 Air Canada and Canadian Airlines

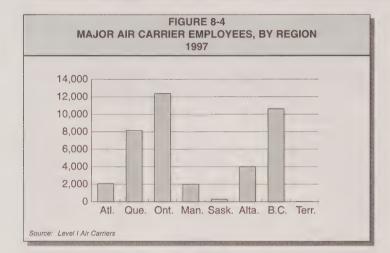
# TABLE 8-18 DISTRIBUTION OF EMPLOYMENT BY LEVELS I-IV AIR CARRIERS

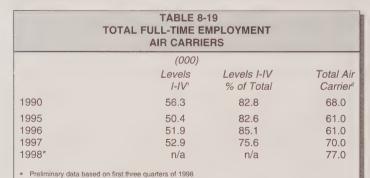
			Levels I - III				
Year	Pilots and Copilots	Other Flight Personnel	Management & Administration	Other Carrier Personnel	Total Levels I - III	Total Level IV	Total Levels I - IV
1990	6,080	8,691	3,467	33,738	51,976	4,355	56,331
1995 1996 1997	6,295 6,478 6,757	8,010 8,593 9,217	3,590 3,523 3,584	28,408 28,411 28,977	46,303 47,005 48,535	4,077 4,537 4,361	50,380 51,542 52,896

Level I – III: Canadian air carriers that in each of the two calendar years immediately preceding the report year, transported 5,000 revenue passengers or more and 1,000

Level IV: Canadian air carriers not classified in Levels I-III that, in each of the two calendar years immediately preceding the report year, realized annual gross revenues of less than \$500.000 for air services for which the air carrier held a license.

Source: Statistics Canada Cat. 51-206-XPB





2 Statistics Canada Survey of Employment, Payroll and Hours (SEPH).

Table 8-19 illustrates the total number of full-time workers employed by air carriers between 1990 and 1998.

#### Marine

Carriers based in Canada reported 14,328 employees in 1996, with vessel crew accounting for over two-thirds of all these employees. Thirty per cent of vessel crew were classified as officers.

Between 1990 and 1995, government-owned carriers were the most significant employers, accounting for 57 to 59 per cent of total personnel. Due to confidentiality considerations, the 1996 figures for private-carrier employees had to be amalgamated with those for government carriers. Transport Canada expects, however, that much the same relationship would have been observed in that year. For-hire carriers accounted for 38, 39 and 42.5 per cent of all employees in 1990, 1995 and 1996, respectively.

The number of workers employed by Canadian-based carriers remained relatively stable between 1990 and 1995. A 37 per cent decrease in 1996, however, can be accounted for mainly because in that year Canadian Coast Guard

1 Statistics Canada Cat. 51-206-XPB

(CCG) personnel ceased to be included in the employment statistics for government carriers.

Table 8-20 shows the number of people employed in various categories by Canadian-based marine carriers.

Preliminary data<sup>14</sup> for total marine employment for 1998 indicates that total employment in the marine industry, including incidental services 15, has decreased by an estimated 37 per cent since 1990. The share of personnel at Canadian-based carriers, including Canadian Coast Guard personnel, is estimated to have remained relatively stable<sup>16</sup>.

Table 8-21 clarifies the adjustment to marine-employment data starting in 1996, the year in which Canadian Coast Guard employees were first excluded from employment data attributed to Canadian-based carriers.

Ferry operations account for a large proportion of employment in the marine transport services sector. In 1996, ferry operations generated about two thirds of all transportation jobs provided by Canadian-based carriers.

A number of ferry operators in Canada are Crown corporations and are therefore included in the "Government" employment figures in Table 8-21. Information from the Canadian Ferry Operators Association suggests that, in 1996, 85 per cent of all employees in ferry operations were employed by government services 17.

#### **TABLE 8-20 EMPLOYMENT** BY CANADIAN-BASED MARINE CARRIERS'

	(In thousands of workers)						
		Government	For-Hire	Private	Total		
1990	Vessel Crew	7,490	6,334	897	14,721		
	Other	6,110	2,702	451	9.071		
	Total	13,600	9,036	1,348	23,792		
1995	Vessel Crew	6,948	6,256	319	13,523		
	Other	6,185	2,461	124	8.702		
	Total	13,133	8,717	443	22,225		
1996 <sup>2</sup>	Vessel Crew	5,148	4,493	N/A	9,641		
	Other	2,805	1,882	N/A	4,687		
	Total	7,953	6,375 <sup>3</sup>	N/A	14,328		
1997 E	st. Total	6,624			11,517		

- Does not include employees from employer associations.
   Preliminary data. Starting in 1996, data for Government carriers does not include Canadian Coast Guard personnel. Private carrier employee counts included with Government carriers.
- 3 Does not include contract employees.

Source: Statistics Canada, Cat. 54-205, Transport Canada

#### **TABLE 8-21 EMPLOYMENT** BY MARINE SECTOR

DI MARINE SECION							
(In thousands of workers)							
	Canadian-	Adjusted Data:	Per cent	Total			
	Based	Canadian-Based	of	Marine			
	Carriers¹	Carriers <sup>1</sup>	Total	Employment <sup>2</sup>			
1990	23.8		79.3	30.0			
1995	22.2	17.8	79.2	28.0			
1996	13.8		77.4	23.0			
1997 est.	11.5	16.9	81.6	20.7			
1998	n/a	n/a	n/a	19.0			

- Sources: 1 Statistics Canada Cat. 54-205. 1996 is the most current year of data at this level of detail. Data for 1997 is a Transport Canada estimate. Canadian-based Carriers: starting in 1996, does not include Canadian Coast Guard (CCG) personnel. Adjusted Data: adjusted to include CCG personnel. "Per Cent of Total" includes CCG personnel
  - 2 Statistics Canada, Survey of Employment, Payrolls and Hours, adjusted by Transport Canada. Includes employment related to incidental services

<sup>14</sup> Transport Canada estimate

<sup>15</sup> Incidental services: jobs which are associated with the marine industry, but are not defined in Statistics Canada, Cat. 72-002.

<sup>16</sup> While the share of total employment is assumed to have remained stable, the actual numbers of employees, including CCG personnel, has declined.

<sup>17</sup> To minimize the possibility of double counts, it is assumed that government and private employment figures provided by Statistics Canada include all jobs reported by the members of the Canadian Ferry Operators Association.

# TABLE 8-22 REGIONAL DISTRIBUTION OF EMPLOYMENT BY CANADIAN FERRY OPERATORS\*

	British Columbia	Prairies and Territories	Ontario	Quebec	Atlantic	Total
1990	3,332	61	591	645/745	3,766	8,395/8,495
1995	4,605	57	450	610/740	3,310	9,032/9,162
1996	4,785	57	327	597	3,310	9,076
1997	4,872	57	344	609	1,670	7,552

 Limited to members of the Canadian Ferry Operators Association; split numbers for Quebec due to seasonal fluctuations

Source: Canadian Ferry Operators Association (CFOA)

Employment by ferry operators decreased by 17 per cent in 1997, primarily due to the opening of the Confederation Bridge between Prince Edward Island and the mainland and the subsequent reduction of ferry services.

British Columbia accounted for almost two thirds of all employment by ferry operators in 1997. The Atlantic region, even with the reduction of services between Prince Edward Island and the mainland, continued to be a major employer, generating over 20 per cent of jobs related to ferry operations.

Total employment in this industry decreased by approximately 11 per cent between 1990 and 1997. British Columbia is the only region where employment was higher in 1997 than in 1990.

Table 8-22 shows the regional distribution of employment by Canadian ferry operators in 1990, 1995, 1996 and 1997.

#### **Data Gaps in Transport Services**

The above sections do not by any means cover all the personnel

employed in the transport services sector. The following examples are meant to provide the reader with an indication of some, but not all, of the jobs that have not been included.

For trucking, there is no coverage of small private carriers18 and some for-hire services. Survey, rather than census, approaches may lead to the exclusion of significant carriers (in terms of employment). Local bus operations such as those that serve the disabled19 are not included. Air taxi services and company jobs, other than drivers, associated with local delivery services have also not been taken into account. While the number of taxi and limousine drivers were available from the Census, management, administration, dispatch and maintenance jobs associated with taxi and limousine services were not available. In air, jobs related to general aviation are not captured.

In many sectors, it was not possible to break out full, versus part-time employment. A significant lack of timely data for 1997 and 1998 also made coverage of this area difficult.

It is hoped that in the coming year, information to address many of these gaps will be found, and that a more comprehensive picture of transport services employment will be possible for future reports.

#### TRANSPORT INFRASTRUCTURE

This section includes personnel employed at airports, harbours, ports and other transport-related facilities. It also includes personnel totally dedicated to transport infrastructure construction and maintenance (e.g. rail right of way, roads and highways).

#### Rail

Road maintenance personnel employed by all rail carriers decreased by 33 per cent between 1990 and 1997. This compares very closely with the industry's 37.5 per cent decline in total employment over the same period.

In percentage terms, downsizing has affected all classes of carriers. Class I carriers experienced a 33 per cent decline, while Class II and III carriers saw road maintenance crews drop by 35 per cent. The overall percentage of employees dedicated to building and maintenance of railroads has remained very stable at between 29 to 30 per cent since 1990.

Table 8-23 shows employment in rail infrastructure services.

#### **Highways**

Determining the number of people employed in the construction and maintenance of

- 18 Private carriers with operating expenses of less than \$1 million
- 19 Unless they are operated by the large urban transit companies.

highways in Canada is very difficult because there are no clear sources for this information. In addition, this is an industry affected by economic cycles and other factors. The employment figures shown in this report are based on Census data for the industry classification "Highways and Heavy Construction".

There were 68,820 people employed under this classification in 1996. Over time, employment levels have been unstable, with levels increasing by over 11 per cent between 1991 and 1996, but decreasing by 14 per cent between 1986 and 1991.

Between 1986 and 1996, Ontario, Quebec and British Columbia had the highest levels of employment in this sector. In 1996, these three provinces accounted for 62 per cent of all personnel. Furthermore, employment levels in Ontario and British Columbia increased by 24 and 19 per cent, respectively, over 1991 levels.

Some of the personnel employed in construction and maintenance of highways are federal, provincial and municipal employees. It is impossible, however, to determine how much double counting occurs. In addition, the percentage of people solely employed in heavy construction is impossible to determine. The following figures may therefore be slightly overstated with respect to "highways."

Table 8-24 shows regional distribution of employment in highways and heavy construction.

	Total	Infrastructure	Per cent	Class	Class
	Rail	Services	of Total	1	II and
1990					
General <sup>1</sup>		4,232		3,674	55
Road Maintenance		15,712		13,456	2,25
Total	69,119	19,944	28.9	17,130	2,81
1995					
General <sup>1</sup>		3,369		2,961	40
Road Maintenance		11,555		9,999	1,55
Total	51,754	14,924	28.8	12,960	1,96
1996					
General <sup>1</sup>		3,015		2.632	38
Road Maintenance		10,892		9,392	1,50
Total	48,038	13,907	28.9	12,024	1,88
1997					
General <sup>1</sup>		2,518		2,178	34
Road Maintenance		10,506		9,041	1,46
Total	43,212	13,024	30.1	11,219	1,80

TABLE 8-24 EMPLOYMENT, BY REGION HIGHWAYS AND HEAVY CONSTRUCTION					
	1986	1991	1996		
Atlantic	11,580	9,550	11,150		
Quebec	13,580	11,590	11,745		
Ontario	19,050	16,855	20,900		
Prairies	17,675	14,760	14,180		
British Columbia	9,210	8,615	10,230		
Territories	525	440	605		
Canada	71,615	61,810	68,820		
Source: Statistics Canada, Cat. 93	3-326				

Source: Statistics Canada, Cat. 52-216; Transport Canada

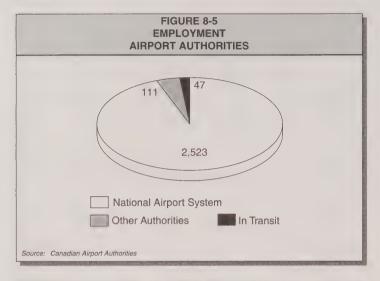


TABLE 8-25 EMPLOYMENT, CANADIAN AIRPORT AUTHORITIES 1998						
	National Airport System	Other Airport Authorities	In Transi			
Newfoundland	44	13				
Prince Edward Island		-	27			
Nova Scotia	-	18	-			
New Brunswick	39	-	-			
Quebec	650		9			
Ontario	901	24	11			
Manitoba	128	3	-			
Saskatchewan	21	-	-			
Alberta	314	15	-			
British Columbia	384	38	-			
Yukon	· 15	-				
Northwest Territories	27	-	-			
Total	2,523	111	47			

#### Air

In 1998,20 the airports included in the national airport system and transferred, employed 2,523 fulltime persons. There were also 111 full-time airport employees engaged at other airport authorities and an additional 47 who were in the process of being transferred from their previous employer (Transport Canada) to being employed by an airport authority. It must be noted that employment at airports which have not been transferred, or employment at airports which have been transferred but are not Local Airport Authorities (LAA) or Canadian Airport Authorities (CAA) are not included in the above figures.

Transferred CAAs and LAAs which are part of the national airports system accounted for 94 per cent of all personnel. CAAs not in the national airports system employed 111 persons (four per cent).

Figure 8-5 shows employment levels at Canadian airport authorities.

Ontario and Quebec, with a number of large airport authorities, had the highest number of airportauthority employees. Significant numbers of personnel were also employed at airports in British Columbia and Alberta.

Table 8-25 shows employment by the Canadian Airport Authorities in 1998

#### Marine

#### Ports

Eighteen ports<sup>21</sup> are slated to become Canadian Port Authorities

- 20 As of February 1, 1999.
- 21 Prince Rupert, Vancouver, Fraser River, North Fraser, Nanaimo, Port Alberni, Thunder Bay, Windsor, Hamilton, Toronto, Port Saguenay, Trois-Rivières, Sept-Îles, Québec, Montréal, Halifax, Saint John, St. John's.

(CPAs) under provisions in the new *Canada Marine Act*. Six are located in British Columbia, four in Ontario, five in Quebec and three in the Atlantic region.

Figure 8-6 shows employment levels at the proposed Canadian Port Authorities, by region.

In 1998, 38 per cent of all employees at the proposed CPAs were located in British Columbia. 34 per cent in Ouebec, 19 per cent in Ontario and the remaining nine per cent in the Atlantic region. An estimated 71 per cent of all staff were full-time, 20 per cent were part-time and the remainder were on contract. Approximately 17.5 per cent of port employees were classified as management and 25 per cent as administrative staff. Other employees made up the remaining 57.5 per cent.

Table 8-26 shows employment by proposed Canadian Port Authorities in 1998.

To establish some historical perspective, Table 8-27 shows historical employment data for ports that were associated with the Canada Ports Corporation.<sup>22</sup>

#### St. Lawrence Seaway Authority

The St. Lawrence Seaway Authority has been going through a downsizing period in the 1990s, and the total number of employees has fallen by over 11 per cent between 1996 and 1998. Both administration and operations employees have recorded similar decreases.

Table 8-28 shows employment, by category, in the St. Lawrence Seaway Authority from 1995 to 1998.

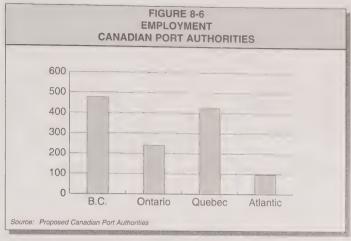


TABLE 8-26 EMPLOYMENT BY PROPOSED CANADIAN PORT AUTHORITIES 1998						
	Total	Full-	Part-	0 /		
	Employees	Time	Time	Contract		
Management	219	209	5	5		
Administration	315	265	39	11		
Other	647	405	202	40		
Total	1,238	879	246	56		
Note: totals do not equal sum of individual parts. Some ports did not provide detailed breakouts of staff.						
Source: Proposed Canadian Port Authorities						

TABLE 8-27 EMPLOYMENT BY CANADA PORTS CORPORATION					
	1990	1995	1996	1997	
CPC Ports	1,194	937	959	921	
Source: CPC Annual Reports					

TABLE 8-28 EMPLOYMENT BY CATEGORY IN THE ST. LAWRENCE SEAWAY AUTHORITY, 1995 – 1998						
	1995*	1996	1997	1998**		
Management Administration Operations Total	N/A N/A N/A <b>739</b>	13 86 611 <b>710</b>	12 84 591 <b>687</b>	15 75 540 <b>630</b>		
Temporary Employees	N/A	34	49	55		
* Number of permanent positions as of March 1995. ** As of June, 1998.						
Source: St. Lawrence Seaway Author	rity					

<sup>22</sup> Vancouver, Prince Rupert, Montréal, Québec City, Saint John, Halifax, St. John's, Churchill, Belledune, Sept-Îles, Trois-Rivières, Chicoutimi, Prescott and Port Colborne.

TABLE 8-29 PLANNED FULL-TIME EQUIVALENTS IN FEDERAL DEPARTMENTS AND AGENCIES						
1990/91 1995/96 1996/97 1997/98 1998/99						
Transport Canada	19,857	18,388	12,257	4,840	4,480	
Canadian Coast Guard			-	3,731	3,468	
Transportation Safety Board	300	300	255	223	229	
Canadian Transportation Agency	491	447	356	260	249	
Civil Aviation Tribunal	6	8	8	8	8	
Total	20,654	18,688	12,512	9,062	8,434	
Source: 1990 – 1999 Estimates, Federal Government Main Estimates						

#### Other Marine Infrastructure Jobs

According to 1996 census data, there were 1,915 lock and cable ferry operators in Canada in 1996, compared with 1,980 in 1991. In some instances, personnel employed in these trades may have already been included with the port authority personnel. Various other jobs related to marine infrastructure, such as dredging, construction and maintenance of piers, berths, and terminals, are not specifically addressed in this section.

Gaps include all personnel employed by non-port authorities and private firms. As a result, the employment picture presented for marine infrastructure is not as comprehensive as it should be due to data availability issues.

### Data Gaps in Transportation Infrastructure

In this section, numerous data gaps exist in the figures presented for employment related to transportation infrastructure. Some employment figures are not captured or impossible to break out from more aggregate information.

For airports, only full-time employment at Canadian Airport Authorities are included; employment at other airports which are not covered in the federal government employment data in the next section have not been reported. Part-time, contract or term employment at any airport has not been identified.

In the case of ports, only employment at the proposed Canadian Port Authorities have been identified. Construction, maintenance and dredging jobs at private companies have not been reported. It was also not possible, for example, to report on employment at private terminal and grain handling operations.

It is expected that employment data shown for construction and maintenance of highways may be high, as it is impossible to break out the number of workers employed in "heavy construction". However, 1991<sup>23</sup> census data for "excavating, grading, paving and related occupations" (not including railway section and track workers), indicated 97,330 workers.

### GOVERNMENT SERVICES TIED TO TRANSPORTATION

#### **Federal Government Services**

The federal government was to devote 8,434 employees in five

departments/agencies during 1998/99 to transportation<sup>24</sup>. This was a seven per cent decrease from 1997/98. These numbers do not include a significant number of positions primarily concerned with transportation in other federal departments and agencies.

Revenue Canada/Customs, Immigration and the federal police have a large number of employees primarily dedicated to border, airport and ports customs inspections, which are transportation-related activities. Agriculture Canada, Heritage Canada (e.g. Parks Canada locks), National Capital Commission (roads, bridges, other transport services). Fisheries and Oceans (Harbours and Ports) all have transport-related functions. Most departments and agencies have some transport-related functions, but employment figures are not captured at a level of detail that allows identification of the exact numbers of employees tied to transportation activities.

Table 8-29 shows planned fulltime equivalents<sup>25</sup> in federal departments and agencies that deal directly with transportation.

### Provincial and Territorial Government Services

It has been estimated that the number of employees working in transport-related activities in provincial and territorial governments has slowly decreased by about 14 per cent since 1992. It must be noted, however, that Table 8-30 does not include numerous transport-related functions such as policing, safety or regulatory services provided by provincial governments, or that are directly and indirectly associated

- 23 Census categories changed between 1991 and 1996; there was no equivalent category reported by the 1996 Census.
- 24 Transport Canada, Canadian Coast Guard, Transportation Safety Board, Canadian Transportation Agency, Civil Aviation Tribunal.
- 25 The number of full-time positions; this does not necessarily directly equate to the number of people working in the positions.

with transportation activities, such as truck-inspection and highwaypatrol services.

Table 8-30 shows employment by provincial and territorial governments from 1992 to 1996.

#### **Municipal Government Services**

It was not possible to develop a comprehensive picture for the number of municipal employees associated with transportation for this year's report. For example, there are no figures available to represent employment in such areas as street cleaning, snow removal, parking control or policing. As pointed out earlier, some municipal employees are included in the employment levels shown for street maintenance and construction. It is hoped that ongoing work in this area will allow for a more comprehensive examination in future reports.

#### ASSOCIATED SERVICES

Estimates of employment in the transportation sector would be incomplete without including the number of people employed in the many other services directly associated with transportation. The services related to "sales" cover a wide variety of positions in such areas as travel agents, tour operators, third party service providers (e.g. intermodal marketing companies) and freight brokers. Services related to "operations" are also numerous: they include navigation support (e.g. air, marine and rail traffic control, marine pilotage, Coast Guard navigation services), food catering (air, rail), marine bunkering and towing, maintenance of equipment, and insurance. Associated administrative support (e.g. accountants, financial experts,

# TABLE 8-30 EMPLOYMENT BY PROVINCIAL AND TERRITORIAL GOVERNMENTS, 1992 - 1996

Transportation and	1992	1993	1994	1995	1996
Communications	45,733	44,604	43,124	42,630	39,202
Transportation*	22,900	22,300	21,600	21,300	19,600

 Estimate, based on the assumption that transportation accounts for approximately 50-52 per cent of total employment in transportation and communications (Federal Government ratios based on Statistics Canada, Employment, Earnings and Hours, 1997, Cat. 72-002-XPB)

Source: Statistics Canada, Public Sector Employment and Wages and Salaries, 1996

auditors, marketing experts) also account for a significant number of jobs. Finally, there are many modal associations offering administrative and other staff functions in such areas as trucking, marine, rail, and bus, as well as professional positions in areas such as marine law, railway and engineering. Unions representing transport employees also have administrative and other staff functions.

#### Marine

#### Pilotage Services

Canada has four pilotage authorities, which employed 537 people in 1997. Employment levels have decreased by about five per cent since 1993. This should not be interpreted as a trend, however, because employment in this industry is very sensitive to traffic and corresponding demand for pilotage services.

Pilots account for between 70 and 75 per cent of total employment at the authorities. Since 1993, contract pilots have consistently accounted for 72 to 74 per cent of total pilots used by the authorities.

Table 8-31 shows the regional breakdown of employment by pilotage authorities from 1993 to 1997.

The Laurentian Pilotage
Authority is the largest employer of all the pilotage authorities, accounting for approximately
40 per cent of all staff employed by pilotage authorities in Canada. It is also the largest employer of contract pilots. The Great Lakes Authority is the smallest organization (in terms of personnel), with about
15 per cent of all staff employed by the four authorities.

#### Maritime Employers Association

The Maritime Employers
Association (MEA) is an
association of employers, such as
shipping lines and grain companies,
that negotiates collective
agreements with longshore workers
and interacts with their union to
provide labour at ports in Montreal,
Trois-Rivières, Bécancour, Toronto
and Hamilton. The employment
figures shown in Table 8-34
represents the unionized workforce
available to the MEA.

The unionized workforce available to the MEA decreased sharply in 1996, the year that Quebec City withdrew from the association. The number of hours worked, however, increased by 25 per cent over 1993 numbers. Labour costs (in current dollars) have increased by 19 per cent between 1993 and 1997.

<sup>26</sup> Each authority uses the services of contract pilots. These pilots, while included in the above data, are not directly employed by the Authority.

TABLE 8-31 EMPLOYMENT PILOTAGE AUTHORITIES					
	1993	1994	1995	1996	1997
Great Lakes Pilotage Administration Pilots Other' Total	12.5	10.5	10.5	10.5	10
	62	55	58	57	63
	8	8	8	8	9
	<b>82.5</b>	<b>73.5</b>	<b>76.5</b>	<b>75.5</b>	<b>82</b>
Atlantic Pilotage Administration Pilots Other' Total	10	10	9	9	9
	50	46	48	51	50
	17	17	13	13	13
	<b>77</b>	<b>73</b>	<b>70</b>	<b>73</b>	<b>72</b>
Laurentian Pilotage Administration Pilots Other' Total	16	15	14	13	13
	188	181	173	173	175
	34	33	32	28	28
	<b>238</b>	<b>229</b>	<b>219</b>	<b>214</b>	<b>216</b>
Pacific Pilotage Administration Pilots Other¹ Total	13	13	13	12	12
	113	110	113	115	115
	45	45	45	40	40
	<b>171</b>	<b>168</b>	<b>171</b>	<b>167</b>	<b>167</b>
Canada Administration Pilots Contract Pilots² Other¹ Grand Total	51.5	48.5	46.5	44.5	44
	413	392	392	396	403
	298	288	286	291	291
	104	103	98	89	90
	<b>568.5</b>	<b>543.5</b>	<b>536.5</b>	<b>529.5</b>	<b>537</b>

Other includes dispatch, pilot boat and other unspecified services

2 Number of contract pilots are included in figures shown for "Pilots"

Source: Pilotage Authorities

TABLE 8-32 EMPLOYMENT MARITIME EMPLOYERS ASSOCIATION'						
	1993	1994	1995	1996	1997	
Employees	2,345	2,254	2,058	1,204	1,285	
Labour Costs <sup>2</sup>	71,995	82,924	81,221	82,640	85,864	
Hours Worked <sup>3</sup>	1,446	1,725	1,683	1,761	1,816	

- Includes ports of Montreal, Trois-Rivières, Bécancour, Toronto and Hamilton (Quebec, Halifax, Saint John 1993 to 1995)
- 2 In thousands of dollars.

Source: Maritime Employers Association

#### **TABLE 8-33 EMPLOYMENT** BRITISH COLUMBIA MARITIME EMPLOYERS ASSOCIATION' 1993 1994 1995 1996 1997 3,794 3,919 **Employees** 3,961 3,953 3,857 Labour Costs<sup>2</sup> 154,144 178.870 184.630 194.806 164.390 Hours Worked<sup>3</sup> 4.216 4.546 4 385 4,569 4,669

- 1 Includes ports of Vancouver, New Westminster, Prince Rupert, Chemainus, Alberni, Victoria, Stewart and
- 2 In thousands of dollars.
- 3 In thousands

Source: British Columbia Maritime Employers Association

Table 8-32 shows employment by the Maritime Employers Association from 1993 to 1997.

#### British Columbia Maritime **Employers Association**

The British Columbia Maritime Employers Association (BCMEA) is an association of employers (shipping lines, grain companies, etc.) that negotiates collective agreements with longshore workers and interacts with the longshore workers union to provide labour at ports along the West Coast. The employment figures shown in Table 8-34 represent the unionized workforce available to the BCMEA.

Table 8-33 shows employment by the British Columbia Maritime Employers Association from 1993 to 1997.

#### Longshore Workers and Material Handlers

According to the 1996 Census, Canada has just under 140,000 longshore workers and material handlers. Longshore workers made up 5.5 per cent of this workforce. By definition, the figures for the MEA and BCMEA would also be included in these data. Therefore, the census data has been used to calculate total employment for "Associated Services". It is interesting to note that the numbers quoted by the BCMEA for 1996 are considerably higher than the number of longshore workers shown for British Columbia in the census data. This indicates that some of the BCMEA workforce (approximately 23 per cent) are probably considered as material handlers in the census definition.

It is also impossible to determine whether material handlers are limited to the marine sector or whether they also include

### TABLE 8-34 CENSUS EMPLOYMENT DATA LONGSHORE WORKERS

1991':	Canada	Atlantic Region	Quebec	Ontario	Prairie Provinces	British Columbia	Territories
Longshore Workers	8,795	N/A	N/A	N/A	N/A	N/A	N/A
1996: Longshore Workers	7,705	1,925	1,725	870	160	3,010	15

<sup>1</sup> Group classifications changed from 1991 to 1996 Census. It is not possible to get regional breakouts for 1991 that will match with 1996 data. Source: Statistics Canada, Census

other modes and private operations, such as warehouses and terminals.

Table 8-34 shows the regional distribution of longshore workers and material handlers.

#### Air

### Travel Agencies and Tour Operators

An estimated 30,500 personnel were employed by travel agencies and tour operators in 1998. This was almost identical to employment levels in 1997. It was, however, a significant increase (more than 45 per cent) over 1990 levels.

Employers in Ontario and Quebec accounted for two thirds of all employees in this industry in 1997, with 40 per cent located in Ontario and 27 per cent in Quebec. British Columbia and Alberta accounted for 15 and 10 per cent respectively.

Table 8-35 shows travel agencies and tour operators by estimated employment.

Table 8-36 shows employment by province of travel agencies and tour operators.

### TABLE 8-35 TRAVEL AGENCIES AND TOUR OPERATORS BY ESTIMATED EMPLOYMENT

	1990	1995	1996	1997	1998*
Canada	21,000	30,000	29,466	30,487	30,511

\* Estimate based on first 10 months of data.

Source: Statistics Canada, Annual Survey of Travel Agencies, Tour Operators

### TABLE 8-36 EMPLOYMENT OF TRAVEL AGENCIES AND TOUR OPERATORS BY PROVINCE

	1996	1997
Newfoundland	257	248
Prince Edward Island	NR	NR
Nova Scotia	310	608
New Brunswick	NR	NR
Quebec	6,656	8,343
Ontario	12,712	11,938
Manitoba	872	670
Saskatchewan	597	673
Alberta	3,276	3,052
British Columbia	4,541	4,674

NR: Not Reportable due to confidentiality

Source: Statistics Canada, Annual Survey of Travel Agencies & Tour Operators

#### **TABLE 8-37** DISTRIBUTION OF EMPLOYMENT IN "OTHER" ASSOCIATED SERVICES, 1991 AND 1996

	1991	1996
Customs, Ship & Other Brokers	3,255	4,755
Marine & Railway Traffic Control <sup>1</sup>	2,820	2,275
Transportation Route & Crew Schedulers	1,330	2,085
Air Traffic Control <sup>2</sup>	4,260	4,330
Motor Vehicle Mechanics <sup>3</sup>	159,930	164,670
Air Transport Ramp Attendants⁴	7,675	8,305

- The Railway Traffic Control personnel are already included in the Rail Carrier employment data. The Marine Traffic Control may be included in the Port and Seaway employment figures.
   With the exception of private controllers at places like Southport, Manitoba, these are a subset of total air
- navigation figures already reported earlier.
- Some proportion may already have been included in the trucking employment data.
   Some proportions are already included in the air carrier employment figures.

Source: Statistics Canada Census

It must be noted that while air transport accounts for a large percentage of the business of travel agencies and tour operators, other modes, such as bus and rail, are also covered by these agencies.

#### Air Navigation Services

Census data from 1991 and 1996 indicate that there were 4,260 and 4,330 individuals employed as air traffic controllers in Canada, respectively, in those years. There is no information relating to the numbers of management and administrative staff associated with the air traffic services. However, prior to December 1, 1996<sup>27</sup>, Canada's air navigation system was operated by Transport Canada. Therefore, air traffic controllers and associated management and administration staff are included in the federal government figures shown in Table 8-29.

#### Other Air-Related Associated Services

Associations such as the Air Transport Association of Canada, the Northern Air Transport Association, the Ultra Light Pilots Association of Canada, Canadian Owners and Pilots Association and the Canadian Seaplane Association of Canada, among others, also employ people in the air transport sector. In addition, carrier and air navigation staff are represented by a number of unions. Each of these associations or unions have dedicated staff functions that are not accounted for in this report.

Other associated services include, but are not limited to, catering, cleaning, accounting, finance, marketing and insurance. Employment data for these areas have not been addressed in this report, although it is hoped that ongoing research will allow these services to be covered in the next Annual Report.

#### "Other" Associated Services

As with each section in this chapter, numerous data gaps are evident regarding services associated with transportation. The following paragraphs and table

address some of the gaps using census and industry data, but not completely. It is hoped that continuing research will allow for more complete coverage in future reports.

The Insurance Bureau of Canada estimates that there were 104,000 people employed in the insurance industry in 1997, and that 42.39 per cent of all premiums written<sup>28</sup> were related to transport. Given a direct allocation of resources, there were an estimated 44,100 employees associated with the transport sector. Using the same rationale, historical employment levels were 43,700 in 1993, 45,600 in 1994; 41,700 in 1995; and 40,900 in 1996.29

According to the Canadian International Freight Forwarders Association (CIFFA), the Canadian freight-forwarding industry consists of 280 firms in 1998 that employ 6,100 people directly involved in forwarding and another 9,000 in other activities

Table 8-37 shows the distribution of employment in "other associated services" for 1991 and 1996. As indicated in the table footnotes, in many instances, some proportion of the employment data has already been counted earlier in the chapter. To minimize possible double counts, none of the figures shown in Table 8-37 have been included in the overall summary.

- 27 Air traffic services in Canada were taken over by NAV Canada on December 1, 1996.
- 28 Premiums written: the number of insurance contracts issued.
- 29 The Insurance Bureau cautions against year-to-year comparisons due to changes in sources used each year to compile the data.

### TABLE 8-38 AVERAGE WEEKLY EARNINGS IN THE TRANSPORTATION SECTOR BY MODE:

		(Current Do	llars)				
	Total Transport	Rail	Water	Air <sup>2</sup>	Truck	Public Transit	Other <sup>3</sup>
1985	515	589	561	592	482	459	449
1990	602	770	683	719	544	513	536
1995 1996 1997 1998 <sup>4</sup>	684 695 716 729	942 977 999 990	799 813 829 830	789 803 816 812	599 613 638 671	590 577 627 633	631 659 690 695

1 Does not include owner-operators, private trucking, delivery services or government employees.

2 Does not include incidental services (jobs which are associated with a particular industry, but are not defined in Statistics Canada Cat. 72-002).

3 Other includes taxis, inter-urban, pipeline and other modes.

4 Average based on the first 10 months of 1998.

Source: Statistics Canada, CANSIM and Cat. 72-002 (SEPH)

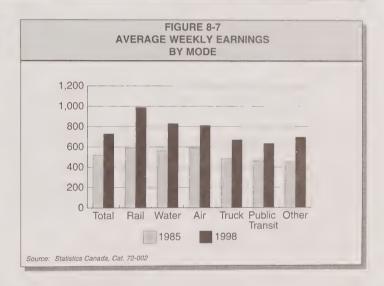
#### AVERAGE SALARIES

#### OVERVIEW

At the end of the first three quarters of 1998, average weekly earnings across all modes, including overtime, was \$729. This was a small (1.8 per cent) increase over 1997 weekly earnings. At the top end, railway employees averaged \$990 per week, whereas public transit employees averaged \$633 and trucking employees averaged \$671. The trucking industry registered the highest increase in average weekly earnings (more than five per cent over 1997), while air and rail experienced a slight decrease.

Between 1985 and 1998, rail enjoyed the largest increase in average weekly earnings including overtime. Trucking and public transit had the smallest increases. Average transportation wages (all sectors) increased by 42 per cent between 1985 and 1998, compared with a 46 per cent increase in the economy as a whole.

Table 8-38 compares the 1985 and 1998 average weekly earnings in the transportation sector by mode.



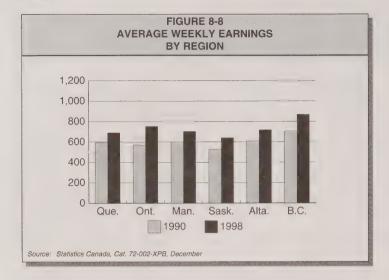


Figure 8-7 shows average weekly earnings, by mode, in the transportation sector.

Average weekly earnings for transportation-related jobs in 1998 were highest in British Columbia, followed by Ontario and Alberta. Workers in Saskatchewan and Ouebec continued to have the lowest average weekly earnings. Employees in Quebec and Saskatchewan registered minor decreases in average weekly earnings in 1998 from 1997, while workers in British Columbia saw

earnings increase by over six per cent.

Figure 8-8 shows average weekly earnings, by region, for 1990 and 1998.

If compared with 1990, employees in Ontario enjoyed the largest percentage increase in average weekly earnings over the last decade, followed by British Columbia and Saskatchewan.

Table 8-39 shows the regional distribution of weekly earnings in the transportation sector.

#### RAIL

Since 1990, average annual compensation<sup>30</sup> for those directly involved in providing rail transportation services has been significantly higher than the overall annual average in the rail sector as a whole. This difference has been widening over time. In 1996, the differential was 12.3 per cent, compared with nine per cent in 1990.

Equipment and roadmaintenance rail workers consistently earn less than the average for the whole rail sector. In 1996, wages for these groups averaged 13 and 11 per cent less than the sector average. Equipment maintenance workers for Class II carriers earned much closer to the industry average than did their Class I counterparts.

Table 8-40 shows the average annual compensation earned in the rail industry in various categories.

	AVERAG	E WEEKLY	TABLE 8 EARNING BY REG	S IN TRA	NSPORTATIO	ON¹		
			(Current Do	ollars)				
	Atlantic						British	
	Region <sup>2</sup>	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Columbia	Territories <sup>3</sup>
1990	N/A	592.12	572.20	599.82	525.73	607.29	705.00	N/A
1995	N/A	673.63	704.92	673.07	578.16	655.47	785.01	N/A
1996	N/A	649.88	725.43	704.79	637.15	707.16	812.97	N/A
1997	N/A	690.01	720.72	700.64	642.55	689.26	816.98	N/A
1998 Preliminary⁴	N/A	688.82	753.25	702.38	641.84	717.80	868.45	N/A

- Does not include owner-operators, private trucking, delivery services or government employees.
   Atl.: Newfoundland, Prince Edward Island, New Brunswick, Nova Scotia (Data available only for Transportation and Storage).
   Terr.: Yukon and Northwest Territories (Data available only for Transportation and Storage).
- 1998 is based on preliminary information available for the first three quarters of the year

Source: Statistics Canada, Cat. 72-002-XPB, December

<sup>30</sup> The gross amount paid to employees, including vacations, holidays, leaves of absence with pay and before deductions for income tax.

#### TRUCK

An examination of regional average weekly earnings in the trucking industry shows a wide range across the country. In 1998, the lowest weekly earnings were in the Atlantic Region, with Prince Edward Island and Newfoundland 30 per cent below the national average. The highest average weekly earnings were in British Columbia, 20 per cent above the national average of \$671 per week. At \$678, the average weekly earnings in Alberta were almost representative of the national average.

Table 8-41 shows the regional distribution of average weekly earnings in trucking in Eastern Canada.

Table 8-42 shows the regional distribution of average weekly earnings in trucking in Western Canada.

#### Bus

In 1996,<sup>31</sup> the average salary of employees of large scheduled intercity bus<sup>32</sup> operators was \$34,359. This was a two per cent decrease from the average salary level reported in 1990 (current dollars).

Large<sup>33</sup> school bus companies reported an average annual salary of \$15,474 in 1996. Average salaries for this industry in Quebec were significantly higher (24 per cent) than the industry average across Canada. Average salaries in Western Canada were 30 per cent below the Canadian average.

# TABLE 8-40 AVERAGE ANNUAL COMPENSATION IN THE RAIL INDUSTRY

	(Current	Dollars)		
1990	Total Rail¹	Transportation Services	Class I	Class II and III
General Transportation		44,855 44,978	45,745 45,916	36,955 37,948
Equipment Maintenance Road Maintenance Total	41,251	37,874 37,024	38,181 38,433	35,131 28,623
1995				
General Transportation Equipment Maintenance Road Maintenance		54,762 56,573 45,795 46,368	55,983 57,068 45,750 47,760	42,800 52,291 46,190 37,422
Total	51,602	, , , , , ,	.,,,,,,	07,122
1996				
General Transportation Equipment Maintenance Road Maintenance Total	51,870	54,597 58,273 44,976 46,040	55,871 59,312 44,569 47,314	42,969 49,767 48,500 38,062
1997²	54,580	N/A	N/A	N/A
"Total Rail" employment limited to carrie     Railway Trends, Railway Association of				

# TABLE 8-41 AVERAGE WEEKLY EARNINGS IN THE TRUCKING INDUSTRY IN EASTERN CANADA

			(Current D	ollars)			
	Ontario	Quebec	New Brunswick	Nova Scotia	New- found- land	Prince Edward Island	l Canada
1990	572	517	401	422	433	393	544
1995 1996 1997 1998¹	642 666 678 717	557 553 573 613	551 553 577 518	510 505 538 543	442 434 516 468	n/a 478 535 467	599 613 638 671

1 1998 based on first 10 months

Source: Statistics Canada, Cat. 52-216

Note: Trucking includes establishments primarily engaged in the provision of trucking. Transfer and related services includes truck "broker-operators."

Average weekly earnings include overtime.

Source: Statistics Canada, CANSIM Series and Cat. 72-002 (Survey of Employment, Payroll and Hours)

- 31 Most current data available at this level of detail.
- 32 1995 and 1996: large scheduled intercity bus operations with annual revenues greater than \$2,000,000. 1990: carriers with annual revenues greater than \$500,000.
- 33 1995 and 1996: large bus operations with annual revenues greater than \$2,000,000. 1990: carriers with annual revenues greater than \$500,000.

# TABLE 8-42 AVERAGE WEEKLY EARNINGS IN THE TRUCKING INDUSTRY IN WESTERN CANADA

	(current dollars) British							
	Columbia	Alberta	Manitoba	Saskatchewan	Canada			
1985	508	427	448	443	482			
1990	627	523	561	484	544			
1995	670	597	562	529	599			
1996	680	627	575	540	613			
1997	724	660	590	569	638			
1998¹	811	678	615	584	671			

1 1998 based on first 10 months

Note: Trucking includes establishments primarily engaged in the provision of trucking, transfer and related services. Truck "proker-operators" are included in this industry.

Average weekly earnings include overtime.

Source: Statistics Canada CANSIM Series and Cat. 72-002 (Survey of Employment, Payroll and Hours)

	AVERAGE AN	LE 8-43 INUAL SALA S INDUSTRY	RY	
	(Curren	t Dollars)		
	1990	1995	1996	1997
InterCity	35,050	36,034	34,359	35,103
School Bus	18,692	14,463	15,474	N/A
Charter & Other	19,609	23,185	19,652	26,408
Urban Transit	42,186	50,882	52,275	52,828
Source: Statistics Canada, Ca	at. 53-215			

Table 8-43 shows the average annual salary in the bus industry. It is difficult to compare salaries over time in the bus industry due to apparent erratic fluctuations in the data.

Large<sup>34</sup> charter and other passenger bus companies in Canada in 1996 reported an average annual salary of \$19,652. Average salaries in Western Canada were over 32 per cent higher than the industry average; in Ontario, average salaries were 16 per cent lower than the industry norm.

Urban transit companies in 1996 reported an average annual salary of \$52,275. Urban transit workers in Quebec enjoyed the highest average salaries, followed closely by British Columbia. Average annual salaries in the Atlantic Region and on the Prairies were considerably lower than the national average.

<sup>34 1995</sup> and 1996: large bus operations with annual revenues greater than \$2,000,000. 1990: carriers with annual revenues greater than \$500,000.

#### MARINE

Preliminary data indicate that labour costs in the water-borne trades declined by four per cent in 1996. In the case of government carriers, most of the decline can be explained by the exclusion of Canadian Coast Guard data. (In 1997, the data shows a slight increase (two per cent). Labour costs for for-hire carriers increased throughout the 1990 to 1997 period.

Table 8-44 shows the labour costs of the Canadian-based marine carrier sector.

#### ATR

Average annual salaries declined marginally for all employees' groups except "other carrier personnel" in 199735 (Level I-III carriers). Pilots and other flight personnel saw average salaries decrease by 0.8 and 2.1 per cent, respectively. Average annual salaries of general management and administrative staff decreased by two per cent, whereas other carrier personnel saw increases of 1.8 per cent. Overall, average salaries paid to Level I to III air carrier personnel were 11.5 per cent higher than those received by Level IV carrier personnel. This was a significant improvement over 1990, when average salaries received by employees of Level IV carriers were 30 per cent less than those paid to their Level I to III counterparts.

Table 8-45 shows the distribution and average annual salary level of various employment categories in Levels I to IV for Canadian air carriers.

### TABLE 8-44 ANNUAL LABOUR COSTS PER EMPLOYEE OF CANADIAN-BASED MARINE CARRIERS

	(Current Dollars	)	
	Government	For-Hire	Total
1990			
Vessel Crew	36,395	46,950	41,492
Other	54,279	32,137	47,549
Total	44,429	42,520	43,832
1995			
Vessel Crew	45,652	52,466	49.301
Other	55,186	36,380	50,013
Total	50,142	47,925	49,580
19961			
Vessel Crew	46,097	53,257	49.395
Other	44,912	39,841	42,944
Total	45,679	49,552	47,350
1997			
Vessel Crew	48,445	56.250	52,559
Other	46,553	42,493	44.879
Total	47,709	52,329	48,426
	,		,

<sup>1</sup> Preliminary data. Private carrier information included with government carriers Source: Statistics Canada, Cat. 54-205

#### **TABLE 8-45** LABOUR COST OF CANADIAN AIR CARRIERS

			Level IV	Levels I - IV			
Year	Pilots and Copilots	Other Flight Personnel	Management & Administration	Other Carrier Personnel	Total Levels I - IV	Total Level IV	Total Levels I - IV
1990	75,833	30,341	41,151	37,194	40,832	31,430	40,105
1995	77,482	35,951	48,734	40,132	45,153	42,794	44,962
1996	82,341	38,061	51,072	42,448	47,789	43,700	47,429
1997	81,719	37,248	50,093	43,216	47,949	43,003	47,542

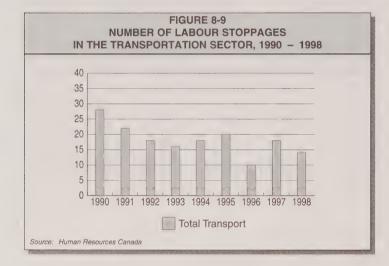
Level I - III: Canadian air carriers that in each of the two calendar years immediately preceding the report year, transported 5,000 revenue passengers or more and

1,000 tonnes of revenue goods or more.

Canadian air carriers not classified in Levels I-III that, in each of the two calendar years immediately preceding the report year, realized annual gross Level IV:

revenues of less than \$500,000 for air services for which the air carrier held a license.

Source: Statistics Canada Cat. 51-206-XPB



#### LABOUR STOPPAGES IN **TRANSPORTATION**

#### NUMBER OF WORK STOPPAGES

Canada has enjoyed relatively few labour stoppages since 1990. The years 1990 and 1991, with 28 and 22 stoppages respectively, were the most active years in terms of labour action. In both years, the bus/urban transit industry accounted for the highest proportion of work stoppages.

Figure 8-9 shows the number of labour stoppages in the transportation sector.

In 1998, the air, truck and water industries accounted for most labour stoppages (64 per cent), with three stoppages each. Bus and urban transit industries had four stoppages. There was one labour action leading to a work stoppage in the rail industry.

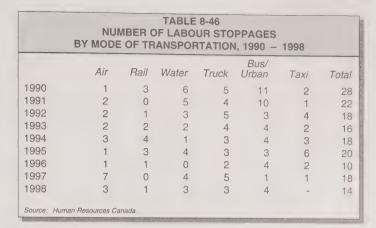
Table 8-46 shows the number of labour stoppages from 1990 to 1998.

Three stoppages in the rail sector during 1995 led to that year having the highest number of affected employees due to work stoppages since 1990. Of the 35,252 employees affected in 1995, over 89 per cent were railway employees.

Figure 8-10 shows the number of employees involved in labour stoppages since 1990.

There were 2,283 workers involved in the 18 labour stoppages that occurred in 1997. The air sector accounted for 52 per cent of total worker involvement. The trucking and water industries accounted for 25 and 21 per cent, respectively.

Table 8-47 shows the number of workers involved in labour stoppages from 1990 to 1998.



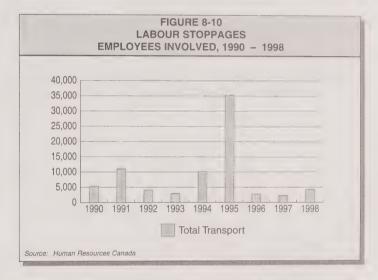


	TABLE 8-47								
NU	NUMBER OF WORKERS INVOLVED IN LABOUR STOPPAGES								
	BY MODE OF TRANSPORTATION, 1990 - 1998								
					Bus/		Total		
	Air	Rail	Marine	Truck	Urban	Taxi	Transport		
1990	24	1,880	408	570	2,385	44	5,311		
1991	520	0	267	131	10,070	41	11,029		
1992	543	258	1,305	651	1,150	179	4,086		
1993	446	1,612	106	245	533	29	2,971		
1994	538	678	3,500	40	974	4,433	10,163		
1995	65	31,540	2,306	209	838	294	35,252		
1996	147	502	0	100	2,031	49	2,829		
1997	1,177	0	472	559	68	7	2,283		
1998	2,693	25	378	140	1,006	0	4,242		
		0							
Source:	Human Resources	Uanada Uanada							

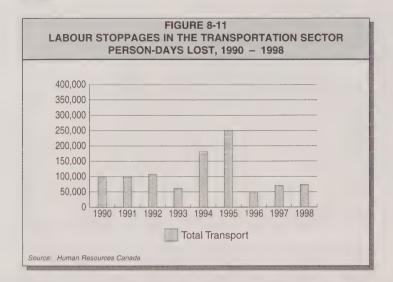


TABLE 8-48 NUMBER OF PERSON-DAYS LOST IN LABOUR STOPPAGES BY MODE OF TRANSPORTATION, 1990 – 1998								
	Air	Rail	Marine	Truck	Bus/ Urban	Taxi	Total Transport	
1990	1,100	29,540	20,160	14,100	31,070	630	96,600	
1991	10,890	0	13,450	1,900	70,990	1,920	99,150	
1992	89,090	1,290	10,070	4,200	1,090	1,950	107,690	
1993	15,460	40,720	210	2,970	1,020	1,030	61,410	
1994	6,960	30,170	32,500	1,750	25,400	86,150	182,930	
1995	3,420	211,730	15,010	1,000	6,000	13,260	250,420	
1996	600	2,150	0	850	42,820	3,440	49,860	
1997	51,420	0	1,499	14,220	2,340	850	70,329	
1998	33,840	180	10,340	660	28,150	0	73,170	
Source: Hu	man Resources	Canada						

#### PERSON-DAYS LOST

In 1998, 73,170 person-days were lost as a result of 14 labour stoppages, averaging just over 5,226 person-days lost per stoppage. The air sector was the most affected, accounting for 53 per cent of the total person-days lost, and averaging just under 11,280 person-days lost per stoppage. The water sector, with 3 stoppages in the year, averaged 3,447 person-days lost per stoppage; trucking averaged just 220.

Figure 8-11 and Table 8-48 show the number of person-days lost in labour stoppages from 1990 to 1998.

# TRANSPORTATION AND TRADE

US trade share continued to increase as the growth of Canada's exports to the US surpassed the one of Canada's exports to the rest of the world.

Transportation is essential to trade. Canada's open economy relies on transportation for international trade, shipping to and receiving goods from foreign markets, and for domestic trade between provinces and regions.<sup>1</sup>

This chapter looks at domestic and international trade and their influence on transportation.

Domestic trade is examined in terms of goods and services<sup>2</sup> trade, and interprovincial and intraprovincial trade; and international trade is looked at in terms of goods and services trade, trade with the US,

and trade with other countries. In particular, the chapter examines how trade has influenced the type of transportation used, such as the rise of exports creating increased demand for transportation, but only in certain modes.

#### DOMESTIC TRADE

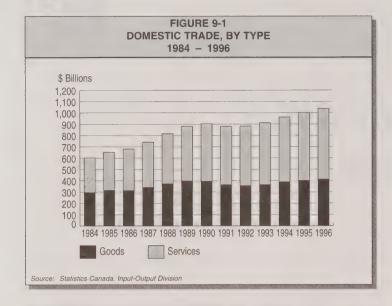
From 1984 to 1996, domestic trade rose from \$602 billion to \$1,037 billion (in current dollars). The increase was steady and interrupted only by the recession in the early 1990s. At seven per cent,

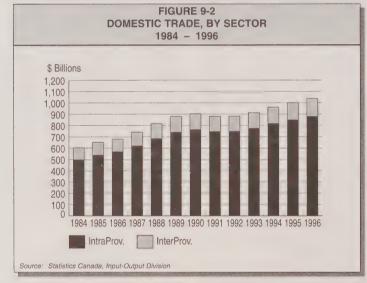
the average annual growth rate was larger in the 1980s than in the post-recession period. From 1992 to 1996, the average annual growth rate was four per cent.

When broken down into goods and services, domestic trade experienced interesting trends from 1984 to 1996. Services' share of domestic trade increased from 50 to 60 per cent, enjoying continuous growth despite the recession from 1990 to 1992. Services also had an average annual growth rate of 6.1 per cent, more than twice that of goods at 2.8 per cent.

<sup>1</sup> Interprovincial trade flows are estimated using the provincial National Accounts information system, which is based on inputs and outputs. The most recent year information is available is 1996, and a modal breakdown of the provincial trade flows is not included.

<sup>2</sup> Goods consist of primary and manufactured products while services refer to activities such as transportation and storage, communication services, wholesale and retail trade services, finance, insurance and real estate services, business and personal and miscellaneous services.





In terms of intraprovincial and interprovincial trade, however, there is little difference in domestic trade. Intraprovincial and interprovincial trade kept a similar share over the years, with intraprovincial trade at 85 per cent and interprovincial at 15 per cent.

Figures 9-1 and 9-2 show Canada's domestic trade by type and by sector from 1984 to 1996.

#### DOMESTIC TRADE AND TRANSPORTATION BY MODE

Examining transportation flows is a good way of estimating how important each mode is to domestic trade. In general, goods and services generate different needs in transportation.

In 1996, air, marine, rail and for-hire trucking moved 431 million metric tonnes of goods. Rail led the way with 46 per cent of tonnage, followed closely by for-hire trucking at 42 per cent. Marine was third, with 11 per cent. Air carried less than one per cent.

Table 9-1 shows that marine, rail and for-hire trucking were the modes used to ship primary products — grains, forestry commodities, metallic ores and concentrates, mineral fuels and non-metallic minerals. However, container shipping accounts for less than one per cent of domestic marine tonnage and six per cent of domestic rail tonnes.

For-hire trucking<sup>3</sup> realized half of its activity in shipping manufactured products — general freight, machinery and equipment, metal fabricated products, vehicles and parts, paper and paper products,

<sup>3</sup> For-hire trucking includes Class I and II carriers earning an annual intercity revenue of \$1 million and more, as defined by Statistics Canada in the "Quarterly For-Hire Trucking (Commodity Origin/Destination) Survey." Courier and messenger service, private carrier and owner operator activities are excluded from the Survey.

and chemicals. Modal transportation flows are examined in Chapter 14, on Freight Transportation

The real share of trucking would be higher, if the activities of small for-hire carriers, private trucking carriers and owner operators were added in.

Table 9-1 shows the domestic transportation flows for 1996.

#### INTRAPROVINCIAL TRADE

From 1984 to 1996, intraprovincial trade registered a five per cent average annual increase, from \$495 billion to \$877 billion, largely due to the growth in services. Figures 9-3 and 9-4 show intraprovincial trade by type and by province from 1984 to 1996. Services' share grew from 55 to 63 per cent.

Following the recession and up to 1996 inclusively, consumer spending on goods stalled in many provinces. Services increased on average by six per cent each year, while goods leveled at three per cent. Ontario remained the leader with 40 per cent of intraprovincial trade, followed by Quebec with 22 per cent, Alberta with 12 per cent and British Columbia with 14 per cent.

In 1996, each province's intraprovincial trade was mostly related to services, accounting for \$556 billion, or 63 per cent of total intra-provincial trade. Personal and other miscellaneous services dominated with a 17 per cent share, followed by financial services (16 per cent), retail and wholesale services (15 per cent), constructionrelated services (14 per cent) and rent owner occupancy services at 11 per cent. The share of transportation services was seven per cent of total intraprovincial services trade.

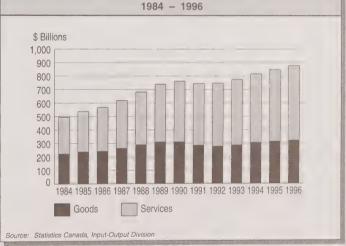
#### TABLE 9-1 DOMESTIC TRANSPORTATION FLOWS 1996

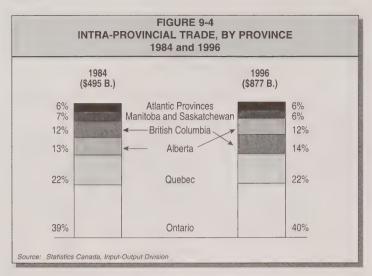
	(Million r	netric tonn	es)		
			For-hire		
	Rail	Marine	Truck	Air	Total
Primary products					
Grains	31.5	6.2	4.3		41.9
Forest prod.	20.1	10.1	29.3		59.5
Metallic ores	47.0	7.1	1.1		55.1
Non-metallic min.	62.2	11.0	21.3		94.5
Minerals fuels	4.1	7.9	23.1		35.2
Total:	164.9	42.3	79.0	0.0	286.2
Manufactured products	35.1	6.5	102.9	0.5	145.1
Total All products	200.0	48.8	181.9	0.5	431.3
Manufactured products	35.1	6.5	102.9	0.5	145.1

Note: \* Traffic flows take into account movements of shipments i.e. either loadings or unloadings (No double counting).

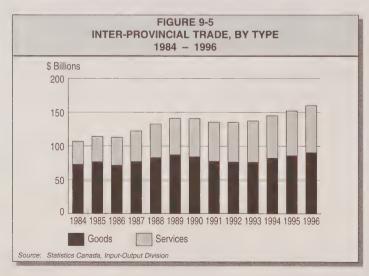
Source: Transport Canada, adapted from various Statistics Canada publications

#### FIGURE 9-3 INTRA-PROVINCIAL TRADE, BY TYPE 1984 – 1996





DOMESTIC TRANS	SPORTATIO	BLE 9-2 N FLOWS 1996	BY SECTO	OR AND	MODE
	(Million n	netric tonn	es)		
			For-hire		
	Rail	Marine	Truck	Air	Total
Sectors					
Intra-Provincial	87.6	30.4	143.1	N/A	261.1
Inter-Provincial	112.4	18.4	38.8	N/A	170.1
Total:	200.0	48.8	181.9	0.5	431.3
Note: * Traffic flows take into a i.e. either loadings or u Source: Transport Canada, ada	nloadings (No doub	le counting).	a publications		



#### **Modal transportation**

Roughly 60 per cent of domestic tonnage was related to intra-provincial activities and was moved mainly by for-hire trucks and rail. As mentioned previously, trucking's share is probably larger than shown here because data on private carriers, small local carriers and owner operators was not available.

Table 9-2 shows Canada's domestic trade flows by sector and mode for 1996.

#### INTERPROVINCIAL TRADE

Although a smaller component of domestic trade than the intraprovincial sector, interprovincial trade is still important. Over time, it shows economic interactions between provinces and reveals changes to such interactions.

From 1984 to 1996, interprovincial trade rose from \$107 billion to \$160 billion, for an average annual increase of 3.4 per cent, despite a negative growth during the 1990–1992 recession. Services drove this performance, registering a 6.1 per cent average annual growth, while goods experienced a 1.8 per cent average annual growth.

Figure 9-5 shows interprovincial trade by type, with services' share climbing from 32 to 44 per cent, and goods, although still dominant, declining in its total share.

#### **Main East-West Routes**

In 1996, the trade between Ontario and Quebec was worth \$20 billion, making each the other's largest domestic trade partner. Combined, Ontario —Quebec trade accounted for 29 per cent of total interprovincial trade. Ontario and Alberta's interprovincial trade followed at 13 per cent.

Table 9-3 presents the key interprovincial trade markets and reveals that neighbouring provinces generally enjoy stronger trade links. Trade flow imbalances are also evident - only Ontario registered a trade surplus every year.

In 1996, total inter-provincial trade amounted to \$160 billion. Ten inter-provincial trade flows. each with over \$5 billion of trade, accounted for 68 per cent of that total, five of which with Ontario as the originating province. The most significant inter-provincial trade activity was observed from Ontario to Quebec, with \$25.5 billion of trade, and composed of 54 per cent goods and 46 per cent services. The trade of goods within that interprovincial market had to do with automobiles, trucks and transportation equipment (\$3 billion); food-processed products (\$2.4 billion); chemical products (\$1.4 billion) and primary metal products. Services exported to Quebec had to do mainly with wholesale services (\$3.6 billion), financial (\$3.4 billion), transportation, business and personal services.

The second largest flow, from Quebec to Ontario, amounted to \$20.2 billion, \$13.2 billion of goods and \$7 billion of services. Main goods traded were foodprocessed items, primary metal products, chemicals and transportation equipment. Services included wholesale and retail services, transportation and financial services.

Figures 9-6 and 9-7 show main inter-provincial trade flows in 1996.

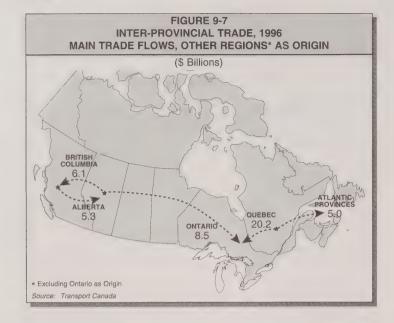
#### **TABLE 9-3** INTER-PROVINCIAL TRADE\*, 1996 MAIN EAST-WEST ROUTES

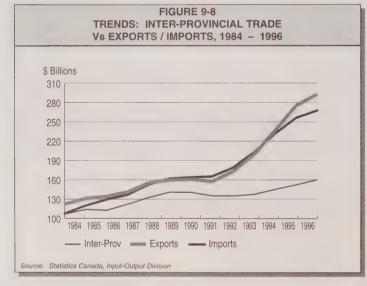
	(\$ Billion)		
Davidas (furnal tax)	Trade Value	Total 2-way	Share in %
Routes (from/ to) Ontario / Quebec Quebec/ Ontario	25.5 20.2	45.7	29%
Ontario / Alberta Alberta / Ontario	12.1 8.5	20.7	13%
Ontario / B.C. B.C. / Ontario	10.5 4.0	14.6	9%
Ontario / Man. & Sask. Man. & Sask./ Ontario	7.3 4.9	12.2	8%
Alberta / B.C. B.C. / Alberta	6.1 5.3	11.4	7%
Ontario / Atlantic prov. Atlantic prov. / Ontario	8.2 2.4	10.6	7%
Quebec / Atlantic prov. Atlantic prov. / Quebec	5.0 2.9	7.9	5%
Alberta / Man. & Sask. Man. & Sask. / Alberta	4.5 3.4	7.8	5%
Sub-Total:		130.8	82%
Other routes		29.4	18%
TOTAL Inter-provincial trade:		160.2	100%

Note: \* No double counting as the exports of one province are the imports of another. Source: Transport Canada, adapted from Statistics Canada, Input-Output Division

#### FIGURE 9-6 **INTER-PROVINCIAL TRADE, 1996** MAIN TRADE FLOWS, ONTARIO AS ORIGIN







#### **Major Goods and Services**

In 1996, the major goods shipped in interprovincial trade were:

- passenger autos, trucks and other transportation equipment at \$9.8 billion;
- fruits, vegetables and other food products at \$8.1 billion;
- chemical products at \$8 billion;
- mineral fuels at \$7.9 billion; and
- meat, fish and dairy products at \$6.8 billion.

These goods represent 45 per cent of total goods exported to other provinces.

The major services used were:

- wholesale services at \$16.8 billion;
- transportation services at \$13.7 billion;
- financial services at \$13.6 billion; and
- personal and miscellaneous services at \$8.2 billion.

These services accounted for 75 per cent of total services exported to other provinces.

#### INTERNATIONAL TRADE

Trade flows are a good indication of what is influencing the Canadian economy. Comparing east/west interprovincial trade flows with north/south international trade flows demonstrate how foreign trade increased in economic importance during the early 1990s.

Figure 9-8 shows that from 1984 to 1990, interprovincial trade was almost as important as international exports, with both growing at an average annual rate of 4.7 per cent. From 1990 to

1996, international exports increased at an average annual rate of 10.5 per cent, while interprovincial trade grew at 2.2 per cent. Also from 1990 to 1996, international exports climbed from \$161 billion to \$293 billion, while interprovincial trade went from \$141 billion to \$160 billion. International imports grew significantly, reaching an average annual rate of 7.3 per cent from 1984 to 1990 and 8.5 per cent from 1990 to 1996.

Figure 9-8 shows trends in interprovincial trade versus exports and imports from 1984 to 1996.

#### COMPOSITION OF EXPORTS AND IMPORTS

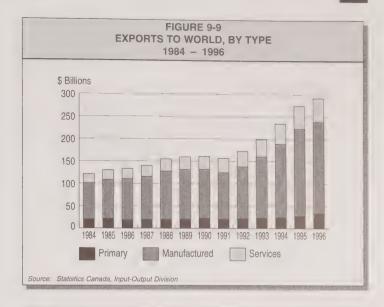
As would be expected, foreign exports and imports are mostly goods, accounting for 84 per cent of total international trade, with services accounting for the remaining 16 per cent.

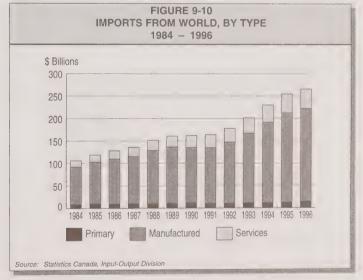
Figures 9-9 and 9-10 show Canada's exports to and imports from the world by type from 1984 to 1996.

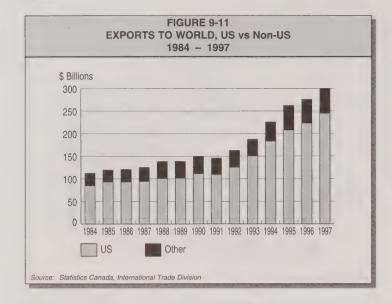
In 1996, the major exports of goods were automobiles, trucks and other transportation equipment, accounting for \$69.1 billion of total manufactured goods exported, followed by pulp and paper products at \$18.6 billion, mineral fuels at \$17.4 billion, machinery and equipment at \$16.5 billion, and primary metal products at \$15.3 billion.

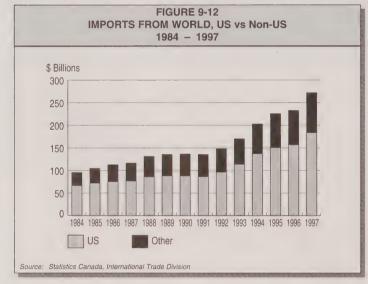
The major exports of services included transportation services at \$14.7 billion, followed by wholesale services at \$10.8 billion, personal and miscellaneous services at \$10.1 billion.

The major imports of goods were automobiles, trucks and other transportation equipment at









\$57.5 billion of all imported manufactured goods, followed by machinery and equipment at \$32.9 billion, electrical and communication products at \$23.1 billion, and chemical products at \$17.8 billion. The major imports of services were personal and miscellaneous services at \$12.3 billion and business services at \$9.9 billion.

#### Main Trade Flows

To illustrate how trade flows affect the choice of modes, the trade flows of goods will be examined in two ways: Canada's trade with the US and Canada's trade with countries other than the US

#### CANADA/US TRADE

#### Impact of Canada-US Trade

Canada's trade with the US has been and continues to be a determining influence in the overall performance of Canada's international trade. From 1984 to 1997, the share of exports to the US increased from 75 to 82 per cent. Between 1984 and 1990, exports had an average annual growth rate of 4.7 per cent, and then, from 1990 to 1997, skyrocketed to almost 12 per cent. Total exports to the US jumped from \$112 billion in 1990 to \$245 billion in 1997. Between 1984 and 1997, exports to countries other than the US experienced a 5.3 per cent average annual growth rate.

Imports from the US oscillated between 64 and 69 per cent, experiencing growth patterns similar to exports. From 1984 to 1990, imports increased by an average annual growth rate of 4.8 per cent, and then, from 1990 to 1997, jumped to 11 per cent. Total imports from the US leapt from \$88 billion in 1990 to

\$184 billion in 1997. As for countries other than the US, imports grew robustly with an average annual growth rate of 8.9 per cent from 1984 to 1997.

Figures 9-11 and 9-12 show Canada's imports and exports to the US and countries other than the US.

### Modal Split and Composition of US Trade

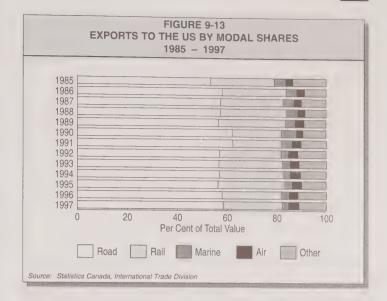
For exports and imports, surface modes were the favourite choice for transborder trade. In 1997, road handled almost 60 per cent of exports to the US and almost 79 per cent of imports from the US, followed by rail with 24 and ten per cent respectively. Pipeline transport (included under "Other") also figured strongly in exports.

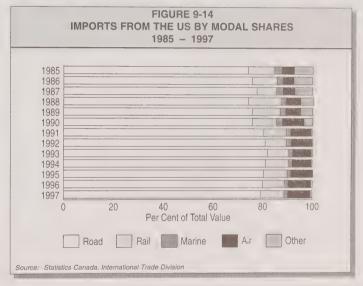
Figures 9-13 and 9-14 show Canada's exports to and imports from the US by modal share.

The major exports of goods were motor vehicles and parts at \$65.9 billion, followed by machinery and equipment at \$60.4 billion, forest products at \$18.1 billion, petroleum products at \$17.3 billion, and non-ferrous and alloy products at \$11.2 billion.

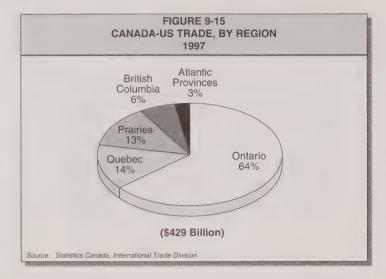
The modes used for shipping and their respective shares were:

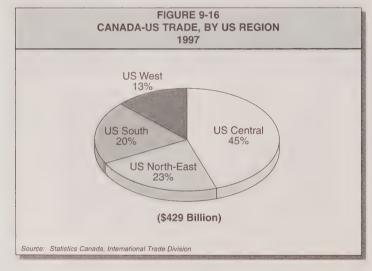
- motor vehicles and parts:
   58 per cent by road, 42 per cent by rail:
- machinery and equipment:
   80 per cent by road, 15 per cent by air;
- forest products: 34 per cent by road, 54 per cent by rail; and
- petroleum products: 72 per cent by pipeline, 19 per cent by marine.





<sup>4</sup> More than one mode of transportation might be used to carry traded goods from origin to destination. For exports, the mode of transportation indicates the mode by which the international boundary is crossed. This may be different from the mode within Canada. For imports, the mode of transportation represents the last mode by which the cargo was transported to the port of clearance in Canada. This may not be the mode by which the cargo arrived at the Canadian port of entry in the case of inland clearance. This may, therefore, lead to some underestimation of Canadian imports by the marine and air transportation modes.





The major imports of goods were machinery and equipment at \$70.9 billion, with road accounting for 80 per cent and air for 18 per cent. Motor vehicles and parts were next at \$50.6 billion, with road accounting for 80 per cent and rail for 20 per cent.

### Canada-US Trade by Region and States<sup>5</sup>

In 1997, Ontario dominated Canada—US trade, accounting for 64 per cent of total trade, or \$140 billion in exports and \$134 billion in imports. Quebec and the Prairies (Manitoba, Saskatchewan and Alberta) followed with 14 and 13 per cent respectively. All Canadian regions, except the Yukon and Northwest Territories, registered a positive balance of their trade with the US (i.e., exports were greater than imports).

Figures 9-15 and 9-16 show Canada–US trade by province and by US region for 1997.

In 1997, the central US region captured \$191 billion of the transborder Canadian trade. The north-east region came second with \$96 billion, followed by the southern region at \$85 billion and the western region at \$57 billion. All US regions, except the south, recorded a negative trade balance with Canada.

<sup>5 &</sup>quot;US Central" includes the states bordering the Great Lakes (central east) and those of North and South Dakota, Nebraska, Kansas, Iowa, Minnesota and Missouri (central west); "US North East" refers to New England States and Atlantic States such as New Jersey, New York and Pennsylvania; "US South" includes southern states from the Atlantic coast to the Gulf of Mexico; and "US West" refers to US mountain states and Pacific states.

#### Major Canada-US Trade Flows

In 1997, Canada and the US had 14 different trade flows worth \$10 billion each, accounting for 81 per cent of total Canada-US trade.

The largest trade flow occurred between Ontario and the US states bordering the Great Lakes, with exports of \$72 billion and imports of \$59 billion that account for 30 per cent of total Canada-US trade. Ontario's exports, mostly to Michigan, were dominated by the vehicles and parts trade, valued at \$48.2 billion. The main modes used were road at \$26.7 billion and rail at \$21.5 billion.

Likewise, Ontario's imports were mainly from Michigan and mostly in the vehicle and parts trade, at \$30.6 billion. The main mode used was road at \$26.6 billion, followed by rail at \$4 billion. Ontario also imported \$16 billion in machinery and equipment, with road as the mode of choice.

Figures 9-17 and 9-18 show Canada-US trade flows involving Ontario and other Canadian regions in 1997.

Table 9-4 identifies the 14 trade flows, showing the trade balance and modal breakdown for each.

Of the 14 trade flows, 8 involve Ontario, an indication of how important this province is to Canada's trade with the US.

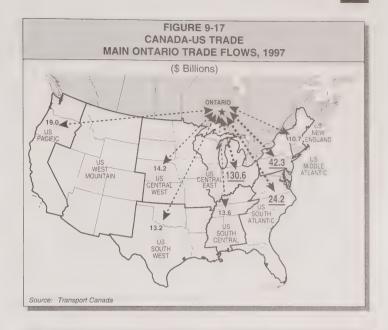




TABLE 9-4 CANADA-US TRANSBORDER TRADE, 1997 MAIN NORTH-SOUTH TRADE FLOWS

(\$ Billion)

0	LIO Danian	Francisco de	lana anta	T-4-1	05	Adele medee weed
Canadian	US Region	Exports	Imports	Total	Share in	Main modes used
Region		from Canada	to Canada	trade	Per cent	( Percent of total value)
Ontario	US Central East	71.7	58.9	130.6	30	Road (76%), Rail (22%)
Ontario	US Middle Atlantic	23.3	19.0	42.3	10	Road (83%), Rail (10%)
Ontario	US South Atlantic	9.6	14.6	24.2	6	Road (80%), Rail (10%)
Ontario	US Pacific	10.9	8.1	19.0	4	Road (60%), Air (27%)
Ontario	US Central West	5.6	8.6	14.2	3	Road (73%), Rail (18%)
Ontario	US South Central	4.8	8.8	13.6	3	Road (79%), Rail (17%)
Ontario	US South West	5.0	8.2	13.2	3	Road (70%), Rail (17%)
Ontario	US New England	5.6	5.0	10.7	2	Road (78%), Air (14%)
Quebec	US Middle Atlantic	11.3	4.3	15.5	4	Road (77%), Rail (13%)
Quebec	US New England	8.1	4.6.	12.8	3	Road (84%), Air (6%)
Quebec	US Central East	8.8	1.9	10.7	2	Road (54%), Rail (34%)
Prairies	US Central East	10.0	4.7	14.7	3	Road (36%), Pipeline (44%)
Prairies	US Central West	8.7	3.4	12.2	3	Road (48%), Pipeline (37%)
B.C.	US Pacific	6.9	6.0	12.9	3	Road (71%), Marine (9%)
Sub-Total:		190.4	156.1	346.5	81	,
Other		54.7	27.8	82.5	19	
TOTAL C	anada/US trade:	245.1	183.9	429.0	100	

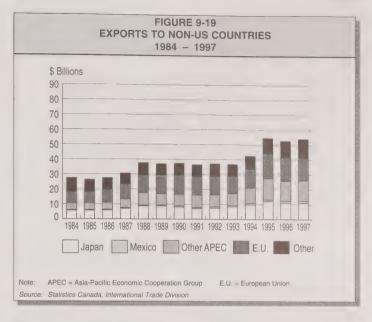
Source: Transport Canada, adapted from Statistics Canada, International Trade Division

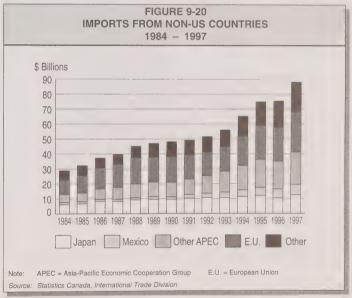
#### CANADA'S TRADE WITH COUNTRIES OTHER THAN THE US

As mentioned previously. Canada's trade with countries other than the US is not as significant as trade with the US. In the 1990s, Canadian exports to the US rose twice as much as exports to countries other than the US. In 1997, Canada's exports to countries other than the US represented 18 per cent of total exports, compared with 25 per cent in 1984. From 1984 to 1990, imports from these countries grew greater on average than imports from the US, but the reverse occurred between 1990 and 1997, with imports falling from 36 to 32 per cent.

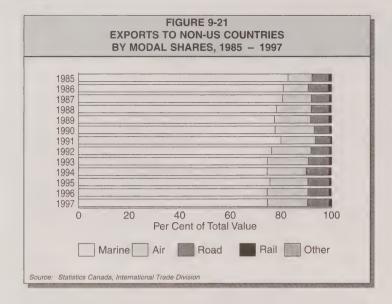
Canada has a negative trade balance with most countries other than the US. In 1997, exports to overseas countries were \$54 billion, while imports from the same countries reached \$88.2 billion. From 1990 to 1997. Canada's exports to Japan, Mexico and other APEC6 countries grew at the average annual rate of 6.6 per cent, while exports to European Union countries increased by 2.6 per cent yearly. On the import side, a similar trend was observed, imports from APEC countries (excluding the US) growing at ten per cent per year over that same period while imports from E.U. countries increased by six per cent annually.

Figures 9-19 and 9-20 show Canada's exports to and imports from countries other than the US.





<sup>6</sup> Not counting Canada and the US, the Asia-Pacific Economic Cooperation Group (APEC) has 17 members: Australia, New Zealand and Papua New Guinea; Chile, Peru and Mexico; Brunei, China People's Republic, Hong Kong, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand.





## Modal Breakdown and Composition of Trade

From 1985 to 1997, marine was the dominant mode in trade with countries other than the US. Marine's share of total trade declined, however, while air's share increased. In particular, marine's share of exports fell from 83 per cent to 75 per cent, while air's share experienced the opposite, increasing from ten per cent to 16 per cent.

In 1985, marine accounted for 51 per cent of total goods imported from countries other than the US. By 1997, the figure had declined to 40 per cent. Over the same period, air's share grew from seven per cent to 22 per cent, reflecting the growing trade of high-valued commodities to and from Canada, such as electronic and telecommunications equipment.

In 1997, exports by marine accounted for \$39.2 billion of total exports to countries other than the US. Forest products were the biggest export at \$10 billion, followed by cereals at \$6.7 billion, metal ores at \$2.9 billion, coal at \$2.5 billion, and non-ferrous metals and alloys at \$2.5 billion. Imports by marine totalled \$35.4 billion, including petroleum products at \$7 billion, motor vehicles and parts at \$4.9 billion, food products at \$3.4 billion and manufactured end-products. (Please see Freight Transportation Chapter for trade traffic by air).

Figures 9-21 and 9-22 show Canada's exports to and imports from countries other than the US by modal share from 1985 to 1997.

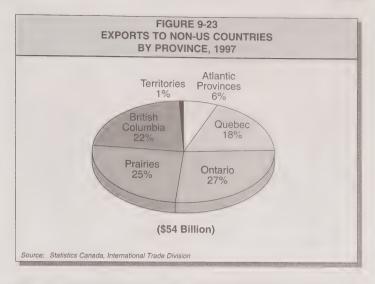
#### **Direction of Trade Flows**

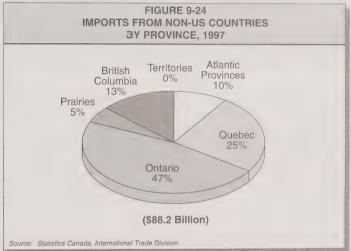
In 1997, Canada's eastern provinces (Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland) accounted for just over half of Canada's exports to countries other than the US, while the western provinces (Manitoba. Saskatchewan, Alberta and British Columbia) accounted for just under half. For import of goods, the eastern provinces accounted for over 80 per cent, dominated by Ontario at 47 per cent.

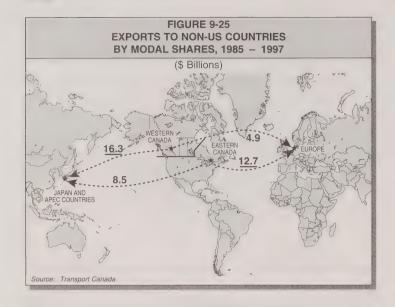
Figures 9-23 and 9-24 show Canada's exports to and imports from countries other than the US by province for 1997.

In 1997, eastern Canada imported more than it exported to countries other than the US. For Ontario, the ratio of imports to exports was \$41.5 billion to \$14.7 billion; for Ouebec. \$22.0 billion to \$9.8 billion: and for the Atlantic provinces (New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland), \$8.4 billion to \$3.3 billion.

For western Canada, the ratio was reversed. For the Prairie region (Manitoba, Saskatchewan, Alberta), the ratio of imports to exports was \$4.5 billion to \$13.7 billion and for British Columbia, \$11.7 billion to \$12.1 billion. The reverse ratio is largely due to the western provinces' major trade with Pacific Rim countries.







## TABLE 9-5 CANADA'S TRADE WITH NON-US COUNTRIES MAIN TRADE FLOWS - EXPORTS, 1997

		(\$ Billion)		
Exports to:	Eastern Provinces	Origin Western Provinces	Total	Main Modes Used (Per cent of total value)
Japan & other APEC	8.5	16.3	24.8	Marine (79%), Air (13%)
E.U. & other Europe	12.7	4.9	17.6	Marine (71%), Air (24%)
Latin America	3.4	1.4	4.8	Marine (53%), Road (23%)
Middle E. & Africa	1.9	2.6	4.5	Marine (75%), Air (13%)
Mexico	0.7	0.6	1.3	Marine (38%), Road (40%)
Other	0.5	0.4	0.9	Marine (84%), Air (10%)
TOTALS	27.8	26.2	54.0	

Source: Transport Canada, adapted from Statistics Canada, International Trade Division

#### **Major Trade Flows**

Canada's export trade to countries other than the US has four major trade flows, which account for 79 per cent of those exports in 1997. These are: western provinces to Japan and other APEC countries at \$16.3 billion; western provinces to the European Union and other European countries at \$4.9 billion; eastern provinces to the European Union and other European countries at \$12.7 billion; and eastern provinces to Japan and other APEC countries at \$8.5 billion.

Figure 9-25 and Table 9-5 show the major trade flows for Canada's export trade with countries other than the US.

Canada's largest trade flow occurs from the western provinces to Japan and other APEC countries and is mainly composed of forest products, followed by cereals, coal, chemicals and food-processed products. Marine was almost the sole mode used, at 96 per cent.

Canada's import trade from countries other than the US also has four major trade flows, which account for 78 per cent of total goods imported. These are: the European Union and other European countries to the eastern provinces at \$28.6 billion; Japan and other APEC countries to eastern provinces at \$24.2 billion; Japan and other APEC countries to western provinces at \$10.0 billion; and Mexico to eastern provinces at \$6.2 billion.

Figure 9-26 and Table 9-6 show the major trade flows for Canada's import trade with countries other than the US.

Notably, three of the flows are to eastern provinces, and mostly to Ontario at that. In 1997, Eastern Canada imported \$28.6 billion from the European Union and other European countries, mostly in manufactured end-products (transportation and telecommunication equipment, machinery and other equipment) at \$11.7 billion, followed by petroleum products at \$5.3 billion and chemicals at \$3.1 billion. The main mode used was marine, at 49 per cent, followed by air at 29 per cent.

Likewise, the eastern provinces imported a total of \$24.2 billion from Japan and other APEC countries, including manufactured end-products at \$17.9 billion; motor vehicles and parts at \$1.5 billion; and food-processed products at \$1.3 billion. The main mode used was marine, at 32 per cent, followed by air at 25 per cent and road at 37 per cent. Road could be overestimated due to transshipments via the US. As well as some of that traffic going to the marine and air modes.7

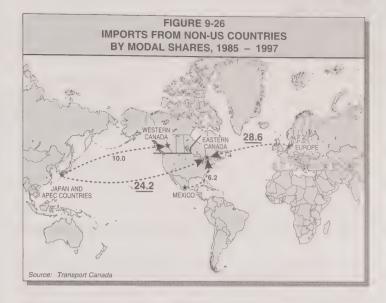


TABLE 9-6
<b>CANADA'S TRADE WITH NON-US COUNTRIES</b>
MAIN TRADE FLOWS - IMPORTS, 1997

	Eastern	(\$ Billions) <b>Destination</b> Western		Main Modes Used
Imports from:	Provinces	Provinces	Total	(Per cent of total value)
Japan & other APEC	24.2	10.0	34.3	Marine (41%), Road (34%)
E.U. & other Europe	28.6	3.9	32.5	Marine (47%), Air (31%)
Mexico	6.2	0.8	7.0	Road (67%), Rail (22%)
Latin America	3.9	0.4	4.3	Marine (48%), Road (36%)
Middle East & Africa	3.8	0.2	4.0	Marine (78%), Air (10%)
Other	5.2	0.9	6.1	Road (58%), Air (26%)
TOTALS	72.0	16.2	88.2	

Source: Transport Canada, adapted from Statistics Canada, International Trade Division

Truck and rail information can be used to estimate the importance of Canada's trade with countries other than the US, routed through the US. However, in the import case, such an estimate is more difficult to arrive at, as cargo control documents information may lead to some underestimation of Canadian imports by the marine and air modes.

USA

Mexico

E.U.

Other APEC

Other countries

**Total World** 

#### TABLE 9-7 DOMESTIC EXPORTS BY COUNTRY GROUPINGS 1997 vs 1998 (\$ Billion) Jan./Dec. Growth Rate Jan./Dec. Destination 1997 1998 (Per cent) 252.4 229.3 +10.18.2 Japan 11.0 - 26.0

13.4

12

14.7

11.6

281.2

9.7

1.3

15.1

10.1

296.7

- 27.6

+ 6.6

+2.7

- 13.0

+ 5.5

Preliminary data for 1998.

Source: Statistics Canada, Cat. 65-001, December 1998

#### TABLE 9-8 IMPORTS TO CANADA BY COUNTRY GROUPINGS 1997 vs 1998

	(\$ Billion)		
Origin	Jan./Dec. 1997	Jan./Dec. 1998	Growth Rate (Per cent)
USA	184.3	203.3	+ 10.3
Japan	12.6	14.0	+ 11.4
Other APEC	21.8	24.8	+ 13.6
Mexico	7.0	7.6	+ 8.9
E.U.	26.9	28.4	+ 5.7
Other countries	20.2	20.1	+ 0.5
Total World	272.9	298.3	+ 9.3

Note: Preliminary data for 1998

Source: Statistics Canada, Cat. 65-001, December 1998

#### RECENT TRENDS

In recent years, trade and the global economy have been tackling the Asian and Latin American currency crisis and recession. In 1998, exports to Japan and Asian APEC countries declined respectively by 26 and 28 per cent from their 1997 levels. Exports under the "Other" category, which includes the Latin American economies, decreased by 13 per cent over the same period.

For the same period, however, exports to the US increased by over ten per cent. By the end of 1998, Canada's exports to the US accounted for 85 per cent of total Canadian exports, compared with 81 per cent a year previous.

Table 9-7 shows Canada's exports by major country grouping.

In 1998, Canada's imports from Japan and APEC Asian countries were still strong, registering an increase of 11 and 14 per cent respectively.

Table 9-8 shows the increase is in accordance with the general trends in imports.

# TRANSPORTATION AND TOURISM

Tourist spending in Canada amounted to \$44 billion, 40 per cent of which was on transportation.

In a country as vast as Canada, transportation and tourism¹ are intrinsically related. There are great distances between tourist destinations, and tourists need a fast, efficient and convenient means of getting from place to place, whether it's around the corner or across the country. Canada's transportation system must cover all demands, both large and small.

The year 1998 was one characterized by change. American

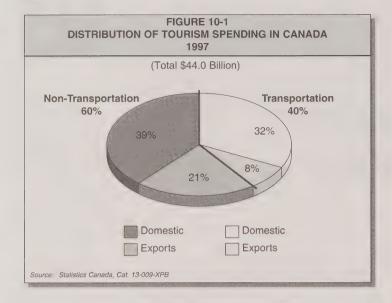
tourists flocked to Canada in record numbers on the strength of their dollar. The number of Asian and European tourists fell as a result of economic and financial difficulties of countries and changes in the relative value of their currencies. At the same time, Canadian travel to destinations other than the US increased. In 1997, tourist spending in Canada amounted to \$44 billion, of which \$17.6 or 40 per cent went to transportation.

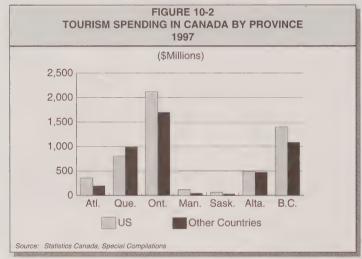
#### TOURISM EXPENDITURES

## TOURISM SPENDING IN CANADA

Tourism spending in Canada has grown steadily during the 1990s, rising at an average rate of 2.9 per cent per year from 1991 to 1997. In 1997, tourism spending reached \$44 billion, a 5.3 per cent increase over 1996. Available data

Tourism refers to people travelling to and staying in places outside their usual environment. These trips are for business, leisure or other purposes, and last no longer than one year. For Canadians within Canada, a trip must be at least 80 kilometres from the traveller's place of residence to be considered tourist travel. International travel refers to travel to or from Canada. This definition of tourism, which is much broader than the common definition that only includes leisure travel, often only to major destinations, is used by the United Nations World Tourism Organization, Statistics Canada and the Canadian Tourism Commission.





indicates that this upward trend continued in 1998, when tourism spending in the third quarter of the year reached \$17.3 billion, a 6.5 per cent increase over the same period in 1997.

The lower Canadian dollar contributed greatly to the rise in tourism spending in Canada. It kept Canadians at home to spend their tourist dollars, while attracting more tourists from the

US. This rise was tempered by the Asian financial crisis, which caused a drop in Asian tourists.

## DISTRIBUTION OF SPENDING

Figure 10-1 shows the distribution of tourist spending in Canada for 1997. Canadians spent the greatest amount, with \$31.3 billion or 71 per cent, while foreign tourists spent \$13.1 billion

or 29 per cent. Growth in tourism spending by foreign visiters was 5.2 per cent in 1997, compared with a 5.3 per cent increase in expenditures by Canadians. Foreign spending on tourism, on the other hand, remained at approximately 23 per cent between 1987 and 1993, and then began to rise to its 1997 level. This trend appears to have continued in 1998.

International tourists staying at least one night spent the greatest proportion of their tourist dollars 39 per cent – in Ontario. British Columbia was second with 25 per cent, and the province of Ouebec third with 18 per cent. Tourists from the US made up about 70 per cent of all overnight visitors, but accounted for just over half the spending, which reflects the fact that overseas tourists stay longer than US tourists. For most provinces, spending by Americans exceeded those of tourists from other countries. However, in Ouebec, spending by overseas visitors exceeded spending by US visitors, while in Alberta, their spending was about equal. Figure 10-2 shows the distribution of tourist spending across Canada.

#### **Spending on Transportation**

Tourism expenditures on transportation were \$17.6 billion in 1997, up 6.6 per cent from the previous year. Transportation spending accounted for 40 per cent of all 1997 tourism spending in Canada. Of this, \$9.8 billion, or 56 per cent, was spent on air transportation, a 10.3 per cent increase from 1996. Air transportation spending has been on the increase since 1991 and accounts for over 55 per cent of the increase in transportation expenditures during this time. Air transportation accounted for about the same 55 per cent share in both

export and domestic tourism spending on transportation.

Motor vehicle transportation was the other major spending category in 1997, with 37 per cent of the total spending. But spending on motor vehicle transportation has only increased by three per cent since 1991.

Intercity bus transport accounted for three per cent and rail for one per cent of the tourism spending on transportation in 1997.

The remaining spending went to water transport, urban transit, taxis and parking.

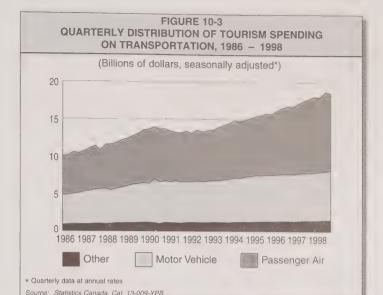
Figure 10-3 shows the quarterly distribution of tourist spending on transportation from 1986 to 1998.

#### **Supply and Demand**

An appreciation of the importance of transportation to tourism can be obtain from looking at National Tourism Indicators, which estimate the supply and demand of commodities in the tourism industry.

Table 10-1 shows supply and demand of tourist goods in Canada in 1997, with supply corresponding to production of goods used by the tourist industry and demand corresponding to tourist expenditures on those goods.

Total tourist spending equals spending by both Canadians and foreigners. Domestic tourism demand equals Canadian spending on domestically produced tourism commodities for both domestic and international travel, including the purchases of airline tickets from Canadian carriers for non-Canadian destinations.



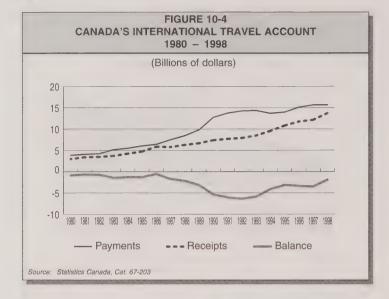
#### SUPPLY AND DEMAND OF TOURIST GOODS IN CANADA 1997 (Millions of dollars) Demand as ----- Demand -Per Cent Domestic Exports Total Supply of Supply Transportation 14,280 3.347 17.627 40.633 43 Passenger air transport 7.909 1.889 9.798 10.511 93 Passenger rail transport 132 71 203 92 Interurban bus transport 397 168 565 628 90 Vehicle rental 353 549 902 1.020 88 1,898 Vehicle repairs and parts 1.829 69 10.542 18 Vehicle fuel 3,229 398 15,545 23 431 634 2.166 29 Other transportation 93 Accommodation 3.375 2.813 6.188 6.682 4,174 2.911 7.085 31.047 23 Food and beverage services 34 4,444 Other tourism commodities 3.275 1,169 91,495 39 Total tourism commodities 25.140 10.204 35.344 Total other commodities 6.149 2.494 8.643 31,253 12,734 43.987 Tourism expenditures Source: Statistics Canada, Cat. 13-009-XPB

**TABLE 10-1** 

Expenditures by foreigners on tourism commodities produced in Canada are tourism exports, including purchases of airline tickets from Canadian carriers for

travel to and/or from Canada.
Tourism commodities are those for which a significant amount of demand comes from tourism expenditures.<sup>2</sup> Since tourism does

<sup>2</sup> Two exceptions to the definition are parking and urban transit, which are considered tourism commodities even though tourism demand for them is not a major portion of their demand. If these services were not available, tourists might be less inclined to visit an area or take part in activities there.



not account for all spending on a particular commodity, tourism demand does not equal supply.

Tourism accounted for 43 per cent of transportation spending by consumers and businesses in 1997. In fact, tourism spending accounted for 92 per cent of air transportation receipts. Similarly, tourism accounted for a high proportion of spending for rail, intercity bus and vehicle transportation. The proportion is much lower, around 20 per cent, for local transportation, including personally owned motor vehicles and spending on taxi and local transit, which are included in the other category in Table 10-1.

For all tourism commodities, including transportation as well as accommodation, food and beverage services, recreation and entertainment, travel agency services and convention fees, tourism demand accounted for 39 per cent of spending.

#### THE TRAVEL ACCOUNT AND INTERNATIONAL PASSENGER FARES

Figure 10-4 illustrates the trends in Canada's international travel account from 1980 to 1998.

#### TRAVEL DEFICITS

Canada's international travel account tallies the value of spending by foreigners travelling in Canada against the value of spending by Canadians travelling outside Canada. A deficit means that Canadians are spending more outside Canada than foreigners are spending in Canada.

After growing for the two previous years, Canada's travel deficit fell sharply by 45 per cent in 1998 to \$1.9 billion. The 1998 deficit is the smallest in 10 years, reflecting strong spending by US tourists, who have come to Canada in record numbers, as well as reduced expenditures by Canadians while outside Canada.

Canadians spent a total of \$15.6 billion outside the country in 1998. While Canadians reduced their spending by three per cent to \$9.7 billion in the US, they increased their spending in other countries by six per cent to \$6.0 billion.

Foreign travellers, on the other hand, spent a total \$13.7 billion in Canada. Visitors from the US increased their spending by 24 per cent to \$8.6 billion, taking advantage of the low Canadian dollar, as well as higher disposable incomes resulting from strong economic growth in their country. In the first nine months of 1998, US tourists accounted for \$2 out of every \$3 dollars spent by foreign travellers in Canada, compared with about \$1 out of every \$2 in 1997.

In fact, Canada's travel deficit with the US fell to \$1.1 billion, a 65 per cent decrease and its lowest level since 1988. But while this travel deficit fell, Canada's deficit with other countries more than doubled to \$835 million as Canadians increased their overseas spending by six per cent to \$6 billion, and overseas visitors reduced their expenditures in Canada by two per cent to \$5.1 billion.

## INTERNATIONAL PASSENGER FARES

In 1998, Canadians purchased \$3.79 billion worth of passenger fares from foreign carriers while, in turn, Canadian carriers sold \$2.38 billion in passenger fares to foreign travellers. This leaves a deficit of \$1.41 billion in this account

Air fares accounted for almost all of these transactions. Canadians purchased \$3.70 billion in air fares from foreign carriers, while Canadian air carriers sold \$2.35 billion in air fares to foreign travellers.

For land transportation, Canadians spent \$84 million on passenger fares from foreign carriers, while foreign travellers spent \$28 million on fares from Canadian carriers. Passenger fares for water transportation are included with air fares and they represent an amount smaller than those for land.

#### TRAVEL OVERVIEW

Table 10-2 presents a summary of Canadian travel in 1997, the latest year for which data is available. Canadian travel includes domestic travel, which is travel by Canadians in Canada; and international travel, which is travel by Canadians to the US and overseas, as well as travel to Canada by visitors from the US and other countries.

#### DOMESTIC TRAVEL

In 1997, Canadians made 128 million trips considered tourist travel. In 1998, domestic travel appeared to increase, evidenced by 51.6 million trips in the third quarter of the year, which represents a 16 per cent increase from the same period the previous year. This increase coincides with a 21 per cent decrease in Canadians going to the US.

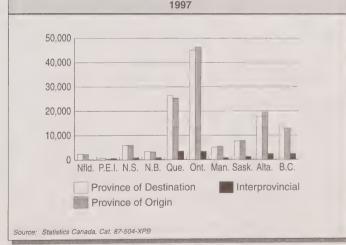
Table 10-2 shows a summary of domestic travel in Canada for 1997.

As Table 10-2 shows, 65.7 million, or 51 per cent, person-trips (to be referred from here on as "trips") in Canada were for more than one night, while 62.5 million trips were completed on the same day. Of the overnight trips, 52.2 million, or 79 per cent, were to a destination in the same

#### **TABLE 10-2** DOMESTIC AND INTERNATIONAL TRAVEL IN CANADA 1997

		Person- trips	Duration	Average distance	Average spending
		(000)	(nights)	(km)	(\$)
Domestic		128,177	1.7	294	128
Same-day		62,450		149	54
Overnight		65,727	3.4	432	200
Intraprovincial		52,239	2.8	267	130
Interprovincial		13,489	5.6	1,069	468
	1998 Data				
Canadians	46,985	54,925	**	-	268
to US	42,768	50,942	**	-	183
Same Day	29,346	35,815	-		31
Overnight	13,426	15,127	7.1	-	540
to Other Countries	4,218	3,984	18.9	**	1,358
Americans	43,857	40,490		-	165
Same Day	28,968	27,089	-	-	48
Overnight	14,890	13,401	3.8	-	400
Nam IIO Danislanda	4.007	4.500			000
Non-US Residents	4,207	4,586	40	-	988
Same Day	229	352	40.0		41
Overnight	3,978	4,234	10.9	-	1,066
Source: Statistics Canada, Spe	cial Compilations	5			

#### FIGURE 10-5 **DISTRIBUTION OF DOMESTIC TRAVEL BY PROVINCE** 1997



province. On average, these trips lasted 2.8 nights and represented a distance of 267 kilometres. Overnight interprovincial trips lasted longer, averaging 5.6 nights. They were also longer, averaging 1,069 kilometres. The average one-way distance for all domestic trips was 294 kilometres.

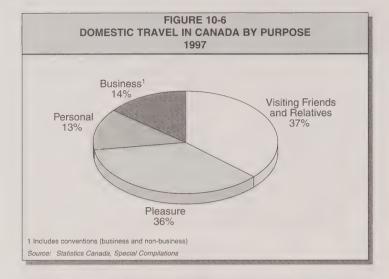


TABLE 10-3 1997 DOMESTIC TRAVEL ACTIVITY ACCORDING TO TRANSPORTATION MODE						
(Per cent of person-trips)						
Overnight						
	Total	Same Day	Total	Non-Business	Business	
Car	91.4	95.7	87.3	90.6	62.3	
Plane	4.5	1.1	7.8	4.6	31.7	
Bus	2.7	2.3	3.1	3.1	3.1	
Rail	0.6	0.2	0.9	8.0	1.6	
Boat	0.4	0.2	0.4	0.4		
Other	0.5	0.4	0.5	0.5	0.7	
Total	100.0	100.0	100.0	100.0	100.0	
Source: Statistics Canada, Special Compilations						

## Distribution of Travel by Province

Interestingly, the distribution of travel by province reflects provincial populations. In 1997, Ontario, the most populous province, was the destination for 35 per cent of the total domestic trips made, followed by Quebec with 21 per cent, Alberta with 14 per cent and British Columbia with 11 per cent.

Figure 10-5 shows the distribution of domestic travel by province for 1997.

On a per capita basis, Canadians took an average of 4.2 trips in 1997. Going by province, Prince Edward Island had the lowest per capita travel rate at 2.8 trips per year, reflecting the size of the province, while the residents of Ontario, Quebec, Newfoundland and British Columbia were just below the national average. The residents of Manitoba, Saskatchewan and Alberta, as well as the residents of New Brunswick and Nova Scotia, travelled more than the national average.

In addition, half of the provinces were a destination for more trips than they were the origin in 1997. Ontario, Manitoba, Saskatchewan, Alberta and New Brunswick were net sources of domestic travellers, while the other provinces were net recipients of domestic visitors.

The importance of interprovincial travel varies greatly by province. For instance, in Prince Edward Island, interprovincial travel accounted for 82 per cent of all trips, including intraprovincial trips, which had P.E.I. as a destination.

This reflects the importance of tourism to P.E.I. By contrast only eight per cent of trips that had Ontario as a destination came from outside the province.

#### Purpose of Travel

In most cases, Canadians travelled domestically for pleasure or to visit friends and relatives. Pleasure trips accounted for 36 per cent of domestic travel in 1997, while visits accounted for 37 per cent. Travelling for business, on the other hand, made up only 14 per cent of all domestic trips, but it accounted for 34 per cent of all spending. Trips for personal reasons, such as health or religion, accounted for the remaining 13 per cent of domestic trips.

Figure 10-6 illustrates domestic travel in Canada in 1997, according to the purpose of the travel.

Canadians visiting friends and relatives was the most common activity as it was part of 54 per cent of all trips. Canadians associated some of their travel to outdoor activities, such as walking (11 per cent of trips), swimming (eight per cent) or fishing (four per cent). They took trips for shopping and sightseeing on 26 per cent and 16 per cent of the trips, respectively.

#### Means of Travel

Canadians turned to the automobile most frequently for domestic travel, using it on 91 per cent of all domestic trips in 1997. Other modes accounted for the remaining nine per cent, with air taking up five per cent. For overnight trips, air travel became more important, accounting for eight per cent of these trips, while the share of automobile trips fell to 87 per cent. For business travel, as well, air becomes important, accounting for 32 per cent of this travel.

Table 10-3 shows 1997 domestic travel activity according to mode of transportation.

#### INTERNATIONAL TRAVEL

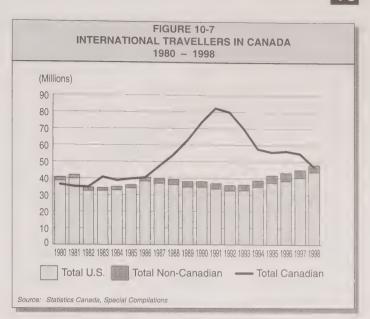
In 1998, 95 million international travellers crossed Canadian borders, representing a decrease of just under five per cent from 1997. At the same time, Canadians took 47 million international trips, a drop of 14.5 per cent from 1997.

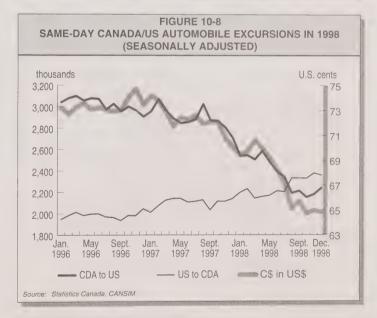
Of these 47 million trips, Canadians travelled more overseas and less to the US. Travellers from the US, however, came in larger numbers - 43.9 million trips, an increase of 8.3 per cent in 1998 from 1997. Trips by overseas (non-U.S.) travellers were 4.2 million, a drop of 8.3 per cent.

Figure 10-7, which presents the distribution of international travellers coming to Canada from 1980 to 1998, shows a steady increase in past years of the number of US travellers coming to Canada.

#### Canada/US Travel

In 1998, Canada/US travel accounted for 91 per cent of all international trips to and from Canada. The most important part

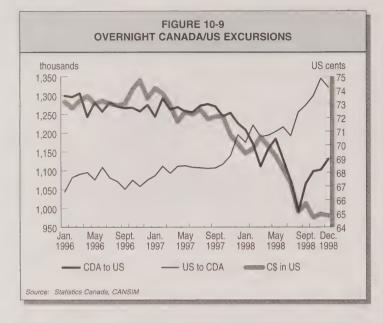


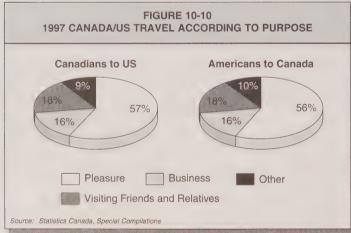


of this travel was same-day automobile, which accounted for 64 per cent of all trips between the two countries.

There has been a major shift in Canada/US travel. In 1998, there was a surge in the number of

Americans making same-day trips to Canada, while the number of Canadians going to the US has been falling for some time. In 1998 as well, the number of sameday and overnight trips that Americans took to Canada exceeded the number of similar





trips that Canadians took to the US. This shift is likely attributable to the fall in the value of Canadian currency accompanied by the strong US economy.

Figure 10-8 shows the number of same-day Canada/US automobile excursions in 1998, while Figure 10-9 shows the number of overnight excursions. Both illustrate that a shift has taken place.

#### Distribution of Travel

For same-day visits in 1997, New York and Michigan were by far the most popular destinations for Canadians, accounting for 18.4 per cent and 8.3 per cent respectively of the total same-day visits.

For stays of one night or longer, the most popular states were New York, accounting for 11.3 per cent of the total trips in 1997; Florida, for 9.9 per cent; Washington, for 8.9 per cent; Michigan, for 6.2 per cent; and California, for 4.7 per cent. In 1997, overnight trips to Florida increased 9.7 per cent, while overnight trips to California increased 7.4 per cent. Overnight trips to New York, however, fell nine per cent.

#### Purpose of Travel

Canadians and Americans have similar reasons for travelling between the two countries. In 1997, pleasure trips, including recreation and holiday trips, accounted for 57 per cent of all trips for both Canadians travelling to the US and for Americans travelling to Canada. Visiting family and friends, accounted for 18 per cent of Canadian trips and 17.7 per cent of US trips. Business was the primary purpose for 15.5 per cent of Canadian trips and 15.7 per cent of US trips. Personal reasons, such as health and religion, made up the remaining 9.4 per cent of Canadian trips and the 9.8 per cent of American trips.

Figure 10-10 illustrates 1997 Canada/US travel according to the purpose of the travel.

#### Means of Travel

As previously mentioned, sameday automobile trips are the most important part of Canada/US travel. In 1998, Canadians used a car to take 96.8 per cent of the 29.3 million same-day trips they made to the US Similarly, Americans used a car to make 93.4 per cent of the 29 million same-day trips they made to Canada. Bus was the next most important mode of transportation, accounting for 2.4 per cent of Canadian same-day trips and 3.3 per cent of American trips.

For overnight trips, automobile travel was less dominant but still the most important mode of travel. Of the 13.4 million overnight trips that Canadians took to the US in 1998, 56.6 per cent were taken by car, while the figure was 63.1 per cent for Americans taking overnight trips to Canada. Air was the next most important mode for overnight travel, accounting for 34 per cent of Canadian trips and 25 per cent of American trips.

Table 10-4 illustrates Canada/US travel by mode in 1998.

### Travel between Canada and Countries other than the US

World economic developments have had a major impact on overseas travel to Canada. The two major factors were the fall in both European and Asian currencies, and the Asian financial crisis.

After losing value in 1997 and the early part of 1998, most European currencies regained some of their strength in the latter part of 1998, but the Asian currencies still remained weak. Unfortunately, these developments affected some of Canada's major overseas travel markets.

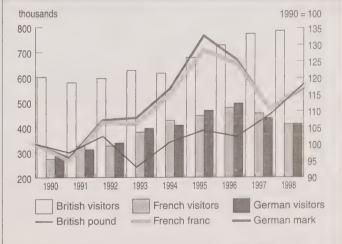
From 1996 to 1997, the number of Asian travellers to Canada fell 9.5 per cent and declined a further 21 per cent in 1998. The number of Japanese travellers to Canada, who make up over 40 per cent of Asian travellers to Canada, declined 14 per cent in 1997 and 16 per cent in 1998. Consequently, Asia's share of overseas trips to Canada has fallen from 35 per cent in 1996 to 29 per cent in 1998.

The number of European travellers to Canada – Canada's largest overseas tourist market – also declined, dropping 2.2 per cent in 1997 from the previous year and declined a further 2.4 per cent in 1998.

TABLE 10-4
1998 CANADA/US TRAVEL BY TRANSPORTATION MODE

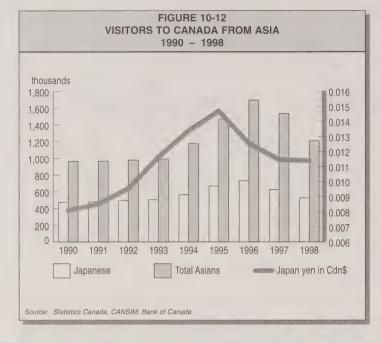
	(000s of person trips)				
	Canadians		Americans		
	(000)	(%)	(000)	(%)	
Same-Day	29,342	100.0	28,968	100.0	
Auto	28,390	96.8	27,062	93.4	
Plane	137	0.5	424	1.5	
Bus	691	2.4	949	3.3	
Other	123	0.4	533	1.8	
Overnight	13,426	100.0	14.890	100.0	
Auto	7,605	56.6	9,402	63.1	
Plane	4,599	34.3	3,663	24.6	
Bus	661	4.9	804	5.4	
Boat	116	0.9	302	2.0	
Foot	326	2.4	575	3.9	
Other	119	0.9	143	1.0	
Total	42,768		43,857		
Source: Statistics Canada, CANSIM			,301		

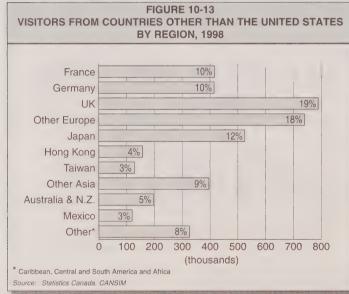
## FIGURE 10-11 VISITORS TO CANADA FROM EUROPE 1990 – 1998



Note: indices for exchange rates are foreign currencies in terms of Canadian dollars.

Source: Statistics Canada, CANSIM; Bank of Canada





Despite this overall decline in European travellers, however, the number of travellers from the United Kingdom increased by 5.8 per cent in 1997 and a further 1.2 per cent in 1998. By contrast, travellers to Canada from Germany declined by 12 per cent in 1997 and a further five per cent in 1998. Similarly, the number of travellers to Canada from France declined four per cent in 1997 and nine per cent in 1998.(Figure 10-11) As most currencies fell against the US dollar, there has also been a reduction in overseas trips via the US, declining 12.9 per cent in 1997 and 15.7 per cent in 1998.

Figure 10-12 shows visitors to Canada from Asia between 1990 and 1998, while Figure 10-11 shows visitors to Canada from Europe between 1990 and 1998 as well as the relative values of the currencies. Figure 10-13 presents the source of the overseas travellers entering Canada in 1998.

#### Distribution of Travel

Ontario was the most popular destination for international travel, attracting 45 per cent of all international trips in 1997. British Columbia was the second most popular with 22 per cent. For all provinces except Quebec and Alberta, travellers from countries other than the US make up between 20 and 25 per cent of the visitors, while in Quebec and Alberta, they make up just under 40 per cent.

Figure 10-14 shows the 1997 provincial destinations of international travellers staying at least one night.

In 1997, large changes in the source of overseas trips occurred in British Columbia, Alberta, and The Atlantic Provinces (Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland). Trips

by overseas travellers declined by about 20 per cent in both British Columbia and Alberta, although British Columbia was able to offset most of this decline from an increase in US visitors. Trips by overseas travellers increased by 11 per cent in the Atlantic Provinces. Other provinces had much more modest changes.

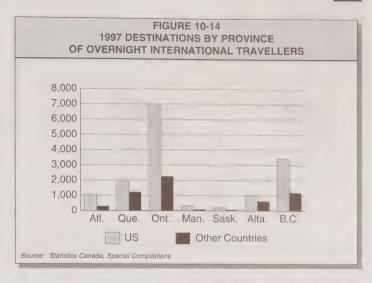
#### Canadian Travel Overseas

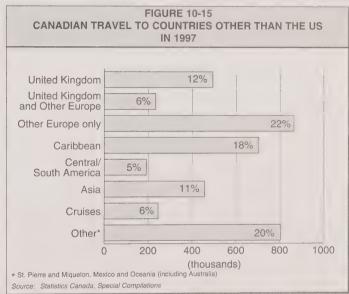
In 1997, Canadians increased their travel to other countries by 8.5 per cent and data for the first nine months shows further increases in 1998. Although Canadians reduced their trips to Europe, they increased their trips to the United Kingdom by 11 per cent in 1997. Europe, however, still remains the most popular overseas destination for Canadians, accounting for 41 per cent of the total overseas trips. The number of trips to Asia rose nine per cent from 1996, while trips to Mexico rose 30 per cent. The number of Canadian trips to other sunspots also increased.

Figure 10-15 shows the distribution of Canadian travel to countries other than the US in 1997.

#### Reason for Canadian Travel Overseas

As in other types of Canadian travel, pleasure trips were the biggest reason for overseas travelling, accounting for at least 50 per cent of travel to and from countries other than the US in 1997. Non-business travel by overseas travellers fell seven per cent in 1997, while it rose seven per cent for Canadians. Business travel rose about 14 per cent for both Canadians and other non-US travellers, accounting for 18 per cent of both Canadian and overseas travel in 1997.





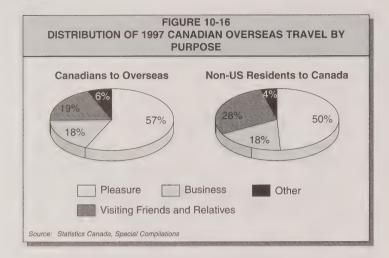


Figure 10-16 shows the distribution of Canadian overseas travel by purpose for 1997.

#### Means of Travel

Virtually all international travel to and from overseas takes place by air, including to and from Canada. Despite this, approximately 20 per cent of overseas travellers entered Canada by land from the US; 16 per cent of Canadians returning by air from countries other than the US returned via the US; and 33 per cent of non-Americans coming to Canada by air came via the US.

# TRANSPORTATION AND INFORMATION TECHNOLOGY

Information and communication technologies make transportation more efficient.

By now, most Canadians are aware of the rapid transformation that the new information and communications technologies, or ICT, have brought into their lives. From cell phones to satellite dishes, there's hardly a family that doesn't rely on at least one of the new technologies to carry out a job or contribute to the day's entertainment.

Yet many Canadians would probably be surprised to learn how

much these same technologies are also dramatically affecting the transportation modes that contribute to their nation's economy. They may realize that ICT has begun to change the way they travel, but be unaware of how much it is changing the way in which they order, buy, sell and deliver or receive goods. This chapter provides an overview of the main impacts of information and communications technology on all four modes that make up

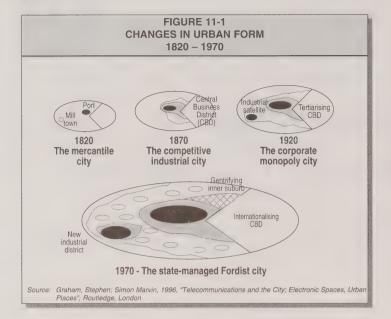
Canada's transportation sector: road, rail, marine and air.

THE "BIG PICTURE":
ICT, THE
TRANSPORTATION SECTOR,
AND GROWTH AND
SOCIALIZATION

Most Canadians would probably say that ICT entered their lives rather suddenly in the early 1990s, and accelerated rapidly as the

<sup>1</sup> The content of this chapter is a summary of information gathered from a project conducted in 1998 by Transport Canada to assess the impact of ICT on the Canadian transportation sector.

The project consisted of a literature review and two seminars in Ottawa, Ontario. The first seminar, focussing on ICT's impact on the supply of transportation, was held on November 2, 1998. The second, focussing on ICT and the demand for transportation, took place on November 27, 1998. Invited speakers included a mix of Canadian and international experts. The chapter summarizes the views expressed by the said experts. References help identify the experts expressing their views.



decade matured. Statistics bear out that ICT did indeed induce gains in economic productivity in the 1990s, but these technologies actually entered industry more than a decade earlier. Why then, did productivity increases take so long to appear?

Such a "productivity lag" occurs because societies need time to diffuse and understand new technologies, and to modify patterns of social and industrial organization to take advantage of them. ICT-related productivity increases in the 1990s may be the harbingers of first-stage changes to industrial and social organization that will become increasingly apparent as we enter the next millenium. A similar productivity lag accompanied the introduction of the railways, which ultimately

increased the productivity of the eras that followed their introduction.

ICTs' impact goes way beyond their repercussions on the transportation sector, as it has repercussions for society as a whole.

One change foreseen is that ICT's ability to make information more easily and rapidly accessible will reduce the costs that businesses will charge to cover transaction and organization costs. These reductions could ultimately generate social and industrial changes.<sup>2</sup>

For example, businesses and other social organizations can reorganize the way they supply their clients' needs by making greater use of contract, rather than

salaried, employees. Indications are that this trend has already begun, and may affect the transportation sector in the long term.

Two examples support this indication. The first is the growing number of businesses that have reduced their staff or are organizing their staff to work from home as telecommuters. The second is the increasing growth in the number of self-employed workers who rely on telecommuting to deliver at least some of their services to their clients.

These ongoing changes in social organization may have various long-term effects on the transportation sector, including changes in worker and employer location, changes in rush hour (or peak-load) commuting patterns, and changes in the need for mass-transit systems.

These changes may have further repercussions: the very organization of a community could ultimately be affected. Consider, for example, the implications of changes in worker and employer location. As more workers switch from regular daily shifts to bi- or tri-weekly meetings, they may be willing to accept longer commuting periods. Consequently, both workers and their employing industries may locate farther outside current urban concentrations, each taking advantage of more spacious and less expensive properties.3

<sup>2 &</sup>quot;Transaction costs" refer to the costs of making a market, and all costs associated with gathering the information needed for all participants in a market (e.g. labour, management) to develop and sign a contract for each specific activity. The reason that we have firms, rather than contract for each individual exchange of labour or goods, is to reduce transaction costs (Coase, Ronald, 1937, "The Nature of the Firm", Economica, 4).

<sup>3</sup> The extent of sprawl, and the pattern of urban form is, of course, also dependent on the deliberate social choices made by society in terms of urban planning. (Marvin, Simon, 1998, "Urban Futures, Integrating Telecommunications into Urban Planning", Proceedings, Transport Canada Seminars on the Impact of Information and Communications Technology on Transportation, Ottawa, Ontario, November, 1998).

Figure 11-1 illustrates how urban centres have, over time, spread from a central core to the outlying suburbs. ICT-diffusion has the potential to accentuate this historical trend. As workers and employers become more autonomous and flexible, scope increases for reducing or avoiding the daily traffic congestion associated with the traditional nine-to-five shift.

# THE IMPACT OF ICT ON THE SUPPLY OF TRANSPORTATION

Currently, most transportation companies use ICT in one or more of the following ways:

- to maximize planning efficiency (scheduling, routing) and administrative functions (payroll, etc.) through the use of optimization software;
- to track vehicles and cargo in real time through electronic communication between equipment, infrastructure and central logistics coordination centres, in combination with two-way communication between centres and drivers or pilots; and
- to automatically transmit transport-related documents such as manifests, bills of lading and invoices, while also automating financial transactions through electronic data interchange (EDI) systems.

## TABLE 11-1 ITS CLASSIFICATION USED BY US D.O.T.

Ви	ndle	Us	er Services
a)	Travel and Transport Management	4. 5.	
b)	Travel Demand Management	8.	Pre-trip Travel Information Ride Matching and Reservation Demand Management and Operations
c)	Public Transportation Operations	11. 12.	Public Transportation Management En-route Transit Management Personalized Public Transit Public Travel Security
d)	Electronic Payment	14.	Electronic payment services
e)	Commercial Vehicle Operations	16. 17. 18. 19.	Commercial Vehicle Electronic Clearance Automated Roadside Safety Inspection On-board Safety Monitoring Commercial Vehicle Administration Processes Hazardous Material Incident Response Commercial Fleet Management
f)	Emergency Management	21. 22.	Emergency Notification and Personal Security Emergency Vehicle Management
g)	Advanced Vehicle Control and Safety Systems	25. 26. 27. 28.	Longitudinal Collision Avoidance Lateral Collision Avoidance Intersection Collision Avoidance Vision Enhancement for Crash Avoidance Safety Readiness Pre-Crash Restraint Deployment Automated Highway System
Sou	urce: Diebold Institute for Public Polic Intelligent Transportation Syste		dies, 1995, "Transportation Infostructures; The Development of traeger, Westport, Connecticut.

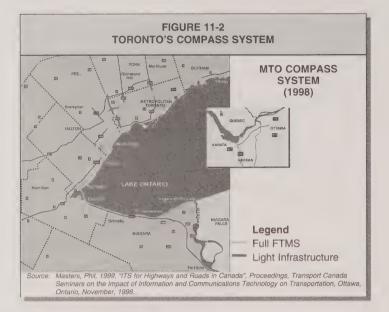
# AN INEVITABLE MARRIAGE OF CONVENIENCE: INTELLIGENT TRANSPORTATION SYSTEMS (ITS) AND ICT

In terms of road transport, ICT-related investments are usually referred to as "intelligent transportation systems" (ITS). The US Department of Transportation (US DOT) divides ITS applications into seven bundles and 29 services, as shown in Table 11-1. The wide scope and sheer number of potential or current applications

listed are an indication of the substantial impact that ITS will have on road transportation.

## Current transport-related uses of ITS

In Canada, it is primarily the provincial and municipal governments that finance and implement ITS traffic-management systems. The federal government involvement thus far has been concentrated on ITS research and development and demonstration projects with the other jurisdictions and the private sector. In the United States, Europe or Japan,



where federal or supra-national governments (such as the European Community) have been extensively involved in both research and implementation.

#### **Traffic Management**

The principal ITS trafficmanagement applications being implemented in North America are:

- real-time tracking of congestion though mounted video-camera monitors that communicate their information to control facilities and allow more efficient response to "incidents" as well as feedback for drivers through the use of electronic billboards;
- automated reactive-control devices, such as traffic lights and ramp meters, that allow for more efficient traffic control;
- automated electronic toll roads that enable automatic vehicle

identification (AVI) and billing through the mail.

In Canada, the use of ITS for road traffic management is relatively advanced in major urban centres, notably in Toronto, Ontario. Toronto uses sophisticated ITS systems for both congestion control and monitoring (e.g. the Compass system and electronic road pricing). Similar congestion-control and monitoring systems are also in place in Montreal, Quebec, and are planned for Vancouver, British Columbia.

#### Toronto's ITS systems

Toronto's Compass system has three main components: one along the Queen Elizabeth Way (QEW) in Mississauga, another along the Burlington Skyway and the third along Highway 4014, as shown in Figure 11-2. A light infrastructure extension to the Compass system includes the links to Highway 407 Electronic Toll Road (ETR),

generating an integrated Toronto highway traffic management system.

The Compass system uses five main traffic-management strategies:

- congestion, detection and confirmation;
- incident management;
- · motorist advisory;
- · congestion management; and
- automated traffic infrastructure, such as ramp metering.

The system detects congestion primarily through detectors embedded in the pavement, and confirms detection through real-time video cameras located along the roadway. The two complementary monitoring networks are connected to a centralized Traffic Operations Centre by a fibre-optic cable network.

The Traffic Operations Centre, which also receives information on road conditions, construction and road maintenance, responds to the electronic information on congestion by notifying and coordinating relevant emergency services, such as police, private towing companies and ambulances. Within seconds of a confirmed incident, the system also communicates the information to motorists through large electronic signs (known as "changeable message signs" or "CMSs") located just before strategic detour points. The system also simultaneously faxes the information to the media.

CMSs also relay non-incidentrelated congestion information, such as messages indicating that

4 OTCC, Ontario Transportation Capital Corporation, 1998, Highway 407 ETR web site, part of the Ontario Ministry of Transportation Web Site, http://www.407etr.com.

A light Compass system is also used on Highway 417 in Ottawa, Ontario.

traffic is moving well (above 75 km/hour), moving slowly (40 - 75 km/hour), or moving very slowly (less than 40 km/hour). All this information is based on the real-time information generated by the vehicle detectors and cameras.

Along the OEW component in Mississuaga, the Compass system also uses one of the main forms of automated traffic infrastructure: ramp metering. Automated traffic lights installed on the ramps generate an orderly and efficient flow of vehicles onto the highway. The traffic lights respond to vehicle detectors embedded in the highway pavement, enabling the lights to respond to both highway flow and the length of the waiting aueue.

Electronic toll roads (ETRs) enable road infrastructure such as electronic tolling technologies to recognize vehicles automatically. Most recognition technology consists of a purchased electronic tag or transmitter, such as a transponder, and electronic readers that transmit the information captured from the transponder to a control centre that logs the transponder's activities, which automatically transmit electronic information (e.g. licence plate numbers), to electronic readers. Electronic identification of vehicles both entering and exiting the ETR allows for automated billing through the mail, which reduces congestion associated with manual toll booths and allows for specific user charges for road use, as well as congestion- and peakload pricing.5

Toronto's Highway 407 ETR is currently the world's leading



example of electronic road pricing. The 69-kilometre highway runs parallel to and north of Highway 401, which runs through Metropolitan Toronto. Highway 407 ETR was built by a publicprivate partnership under the aegis of the Ontario Transportation Capital Commission (OTCC), a semi-autonomous agency of the provincial government created to finance and build new roads in Ontario.

Highway 407 ETR vehicle identification is based on the use of both transponders and video cameras, which capture licence plate information on cars not equipped with transponders. All billing is done monthly by mail, by using Ontario Ministry of Transport databases that link licence plates with addresses.

Pricing for Highway 407 ETR use is designed to cover capital and operating costs, currently projected over 25 years6 and based on peak-load pricing6 principles, as described in Table 11-2.

#### In-vehicle driver information services

In North America, two categories of ITS for traffic management are at the experimental or introductory stages: in-vehicle driver information services and fully automated vehicle control systems.

These services provide drivers with electronic information regarding alternative routes, rideshare passengers, or hotel and tourist attractions. The systems share such features as in-vehicle computers with network connections that allow communication between the vehicle and automatic locating devices such as satellites and digital telephone beacons, or central logistics and information facilities. En-route guidance uses an automatic location device to place the vehicle on a digital map, while logistics routines then suggest the fastest route to a given location: essentially electronic replacement for reading maps and highway signs.

<sup>&</sup>quot;Peak-load pricing" refers to charges and prices designed to recover the capacity costs of road capacity built specifically for the peak load (e.g. rush hour). "Congestion pricing" refers to charges designed to cover the external costs imposed on other motorists (e.g. lost time) by adding another car to an already congested road.

OTCC, Ontario Transportation Capital Corporation, 1998, Highway 407 ETR web site, part of the Ontario Ministry of Transportation Web Site, http://www.407etr.com

## TABLE 11-2 HIGHWAY 407 ETR, PRICES PER KILOMETRE', PER BATE PERIOD AND VEHICLE CLASS

Vehicle Class	Day Time, Peak Period Weekdays, 5:30- 9:30 a.m. 4:00- 7:00 p.m	Day Time, Off-Peak Weekdays 9:30- 4:00 pm 7:00-11.00 pm Holidays and weekends 5:30 a.m -11:00 p	Night Time Period Weekdays 11:00 pm - 5:30 am Holidays and Weekends 11:00 pm - 5:30 am m
Light (5000 kgs or less; e.g. automobiles, light trucks)	10 cents	7 cents	4 cents
Heavy, single unit (5000 kgs. Or more; e.g. single unit trucks, buses)	20 cents	14 cents	8 cents
Heavy, multiple unit; tractor -trailers	30 cents	21 cents	12 cents

1 Additional prices are \$1.00 per trip for all vehicles not equipped with transponders.

Source: OTCC, Ontario Transportation Capital Corporation, 1998, Highway 407 ETR web site, part of the Ontario Ministry of Transportation Web Site, http://www.407etr.com.

While in-vehicle systems are at the introductory stage in North America, one-way map navigation systems entered the market in Japan in 1989. As of 1996, approximately 40 models were being sold by 25 companies, with total sales of 1 million units. The older units now face competition from a two-way system capable of receiving real-time information on congestion and accidents as part of a national Vehicle Information and Communications System (VICS), built through the cooperation of the Ministries of Construction, Post and Telecommunications, and the National Policy Agency. The VICS released in 1996 relied on 600 beacons between Tokyo and Osaka7; it currently uses over 1,800 beacons covering all Japanese expressways.

The most radical and futuristic type of ITS applications are fully automated vehicle control systems

designed to provide better control of the car itself, either through the driver or automatically, much like the anti-lock brakes or cruise control systems Canadians have been using for many years. Future in-vehicle systems will detect the proximity of other vehicles and/or the edge of the roadway or lane. The upcoming generation of this technology will alert the driver accordingly; but subsequent generations will make the appropriate correction automatically. More advanced systems will implement steering and speed control, and will regulate inter-vehicle spacing distances-a development expected to dramatically increase highway throughput.

In their fullest implementation, vehicle control systems can lead to automated highways on which cars will have preset positions and move together in automatic formations<sup>8</sup>, a technique called platooning. Plattooning involves the coordination of multiple vehicles (5 to 15) on a highway using slots of a fixed size, 2 to 8 metres apart, with controlled operation while on the road. While implementation is obviously in the future, it should be noted that a demonstration of an operational automated highway system (AHS) took place in 1997, in San Diego, California.

The main impact of the new ITS systems will be to increase the capacity of road infrastructure, at lower cost than traditional road building, both in terms of money and space. Assessments in most of the literature support ITS investment on the grounds of reducing congestion, increasing safety and reducing environmental emissions (e.g., through reduced running of idle motors). Often overlooked in much of the literature, however, is the latent demand for automobiles, which empirical results indicate can run from 10 to 90 per cent of increases in road capacity, depending on the extent of pre-existing congestion. While the ability of ITS alone to mitigate congestion, injuries and emissions may be limited by latent demand, it is probable that the increases in road capacity generated by ITS, and the corresponding latent demand, will further increase private automobile use. In the long term, ITS's ability to expand road capacity may complement the other long-term trends toward post-suburban sprawl identified earlier in this chapter.

<sup>7</sup> Tokuyama, Hideo, 1996, "Intelligent Transportation Systems in Japan", Public Roads, Autumn, pp 41-45.

<sup>8</sup> Diebold Institute for Public Policy Studies, 1995, Transportation Infostructures; The Development of Intelligent Transportation Systems, Praeger, Westport, Connecticut.

#### **Urban Transit**

There are two principal applications of real-time ITS in urban transit:

- · automated real-time tracking of vehicles, which combines twoway communication between vehicles and control facilities with communication of real-time vehicle locations to clients (e.g. electronic displays in shelters, automated phone replies and Internet sites); and
- · smart cards, which allow for electronic fare payment, and often incorporate several modes of public transport (e.g. bus, subway, or light rail).

To these applications should be added the use of ICT-management tools such as optimization and expert programs, and associated databases designed for more efficient management of urban transit operations. Such programs typically optimize route scheduling, payroll, personnel and equipment allocations, and other management functions.

#### Automated time-tracking of vehicles

The main real-time application of ITS to urban transit involves sending information about the vehicle's progress to a central control facility and back to drivers. The information accumulated can be used by transit management for improved routing, planning and management for vehicles and personnel, as well as operations. For example, real-time tracking enables a central control facility to identify deviations from schedule. The control facility can then communicate corrective measures to drivers. Real-time information about vehicle location and projected arrival can also be provided to customers through automated telephone information

services, electronic digital displays located at urban transit waiting areas, or other methods.

A Canadian example of realtime tracking in urban transit is provided by the "Societé de Transport de l'Outaouais", the urban transit system serving the City of Hull and environs, in the province of Quebec. The real-time tracking system, called SAGE PAS, is based on electronic communication between buses and a system of automated beacons installed along bus routes. The system has four main functions:

- real-time bus location
- visualization of buses on a bus route
- · tracking of planned schedule
- communication with bus drivers.

The Societé de Transport de l'Outaouais communicates this information to passengers through an electronic telephone information service called INFOBUS, which provides the real-time arrival of the next two buses at any given bus-stop. The system is updated every minute.

#### Smart cards

Smart cards are electronic cards that can be purchased to pay fares electronically on one or all urban transit and transport operations, such as subway, bus, light rail, taxi and parking. Machines read the card and automatically debit the correct fare from the credit remaining on the card. The cards can be re-charged through payment into some form of recharging machine, and then activated at first use. Smart-card technology can eliminate all of the different fare systems now in place, including coins, bills, tickets and passes. They could also enable large urban areas with different modes of urban transport to

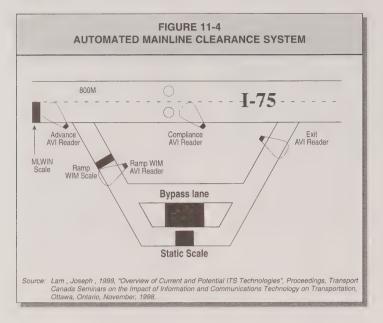
establish a single payment system. While increasing convenience for users, smart cards also reduce transit companies' costs by eliminating the need to collect and count coins. In addition, the cards automatically generate better data about passengers and revenues.

Current Canadian examples of urban transit systems that use smart (or "COMBO") cards are Ajax and Burlington in Ontario. The Outaouais region in Ouebec plans to introduce them in 1999. Smart cards also present an attractive means to maintain and update commercial vehicle driver services records. They could, in combination with other technologies provide an hours of service record for the vehicle operators as well.

#### Automated high-occupancy vehicle lanes

Another interesting potential application of ICT to urban transit is automated high-occupancy vehicle (HOV) lanes for buses, taxis and car pools. These lanes would function similarly to current priority lanes, but with electronic features such as automatic identification and automatic priority at traffic lights and freeway ramps.

Their disadvantage is that they contradict the traffic optimization goal of ITS described earlier in this chapter. HOV lanes are designed to generate high-speed transit for HOV vehicles by monopolizing the use of one lane, thereby generating congestion for low-occupancy vehicles (LOV) and inducing modal shifts away from automobiles. In contrast, ITS traffic control is designed to optimize total traffic flow in all lanes, thus encouraging modal shifts to the automobile. This contradiction highlights the social



dilemma associated with the automobile: whether to consciously improve automobile-use efficiency in order to increase private mobility, or to discourage automobile use in order to reduce automobile-associated problems such as pollution.

In the case of urban transit, the improvements generated by ITS, while important to improving the service to transit clientele, may not match the potential efficiency gains relative to automobiles.9 This is essentially because of the nature of urban transit: A regular, scheduled, public service designed primarily to transport commuters living in densely populated urban areas to and from work at predicable peak hours, with an offpeak clientele constituted primarily of low-income consumers who don't own cars.

One problem is that public transportation is viewed overwhelmingly as an inferior good—transportation for those who have no alternative because of the lack of an automobile, or because of the high cost of driving and parking an automobile <sup>10</sup>. ICT will probably not change these realities, but will improve urban transit service for its clientele.

#### Trucking

The principal current real-time ITS applications in trucking are

- · automated freight corridors
- automated vehicle location (AVL) systems
- electronic data interchanges (EDI) systems.

In this sector, too, these applications are often used together with ICT management tools such as optimization and

expert programs and associated databases designed to allow for more efficient management of freight trucking operations.

Automated freight corridors use automatic vehicle identification (AVI) technology to identify vehicles electronically, allowing for more rapid transit through regulatory stops such as weight and inspection stations, or border crossings. Several Canadian projects related to electronic freight corridors are close to completing feasibility tests and making decisions about final implementation. They include the Advantage I-75/Avion project running through Ontario (Highway 401 from Kingston to Windsor); the US interstate I-75 that connects the states of Georgia and Florida: the border crossings at the Ambassador Bridge at Windsor; and the Peace bridge at Fort Erie, in Ontario.

The Advantage I-75/Avion project allows for electronic clearance at weight and inspection programs for selected transponder-equipped trucks, while allowing all participating American States and the Province of Ontario to maintain existing regulatory regimes. The program underwent an operational test from 1995 to 1997, with 4,500 transponder-equipped trucks and 29 weight/inspection stations equipped with AVI and automated weight-in-motion (WIM) scales.

Figure 11-4 illustrates how the system (known as the Automated Mainline Clearance System) works. Currently, it is being maintained for a year, financed at the expenses of the respective States and province (Ontario), and

- 9 It should be noted, however, that urban transit companies that do become more efficient through the use of ITS systems can actually increase their clientele, an example being the Société de Transport de l'Outaouais.
- 10 Dodge, David; Richard Morill; Kiril Stanilow, 1996, "Implications of Intelligent Transport Systems for Metropolitan Form", Urban Geography, 17(1), pp 714-739.

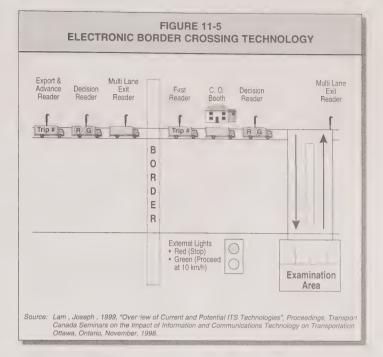
a final evaluation is to follow this experience<sup>11</sup>.

#### AVL/EDI

Trucking firms use automated vehicle location (AVL) and electronic data interchanges (EDI) systems primarily for real-time applications. AVI tags installed on trucks transmit identification data to AVI readers in telecommunications infrastructure such as digital telephone beacons and satellites. These process the information using global positioning systems (GPS), then transmit the real-time vehicle location to central logistics control facilities. AVL technology is usually combined with radio, digital telephone or other two-way communication devices to allow real-time communications between the control facility and drivers. These techniques promote more efficient truck use by, for example, reducing or eliminating driver stops for "call-backs." They also promote more efficient en-route guidance and monitoring, particularly for back hauls, congestion-avoidance, fuel consumption and safety.

These systems can also be used to track container and other types of freight. Managers use a form of bar code that allows them to track real-time freight locations and to communicate with trucking firms, shippers and receivers through EDI.

The most complete examples of vehicles and cargo tracking are probably found in the burgeoning multi-modal courier services, which let their clients access to real-time cargo status and location through the Internet. Figure 11-6 depicts some of the components



found in a typical ITS freight-tracking system.

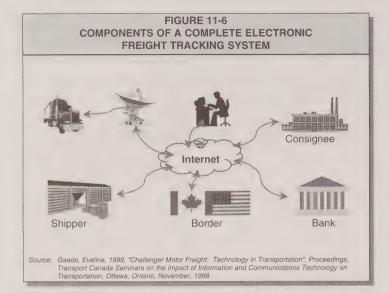
Transport firms use EDI to communicate transport-related information and documents such as manifests, bills of lading, invoices, orders and payments through an integrated electronic network of trucking firms, shippers, receivers, clients, government agencies and other interested parties. EDI is based on the Open System Interconnection (OSI) reference standard—seven layers and conforming protocols that facilitate communication among the internal operating systems of different network users.

EDI transfers transport-related information quickly and efficiently, especially for applications related to prior, accurate information on freight arrival and departure. It allows for optimal use of loading bays and warehouses, as well as rapid electronic payment. EDI is an integral component of just-in-time (JIT) production, a production method that optimizes logistics and minimizes storage. JIT will be discussed later in this chapter under "ICT's Impact on Transportation Demand".

#### Electronic truck-freight markets

A new development related to EDI is the electronic truck-freight market. Electronic markets allow buyers and sellers of freight services to make automatic electronic bids. They are of particular interest for back-hauls because they reduce the transaction costs associated with making freight markets, thus reducing the role of intermediaries such as freight forwarders, as well as the need for, and scope of, long-term

<sup>11</sup> Booze\*Allen & Hamilton, 1998, "ITS Field Operational Test; Compendium of Field Operational Test Summaries," for Turner-Fairbank Highway Research Centre, US DOT.



fixed-price freight contracts. They also allow for more efficient use of trucks by minimizing waiting time and empty back-hauls.

Two interesting examples of existing Internet-based electronic freight markets are the Teleroute market covering Western Europe and the National Freight Exchange in the United States. Teleroute covers 16 countries, offers automatic translations, and allows for bids on characteristics such as weight, cargo type, origin and destination.

All of the ITS-based developments specific to trucking discussed so far may make the trucking industry more efficient and reliable, with lower costs and better service. This in turn may generate reductions in both the equipment and the labour required to carry equivalent tonnekilometres of goods. These impacts, combined with possible reductions in traffic congestion, may increase truck-freight traffic in comparison with other transport modes, depending on the extent of ICT investment and use in the

competing modes.

Electronic freight markets may also increase competition in the trucking industry and make prices more transparent. Freight brokers may become less necessary in the future.

## ICT USE IN OTHER MODES

While transport literature focusses mainly on how road transport has adopted ICT or ITS, both types of technologies are also prevalent in other transport modes, many of which may have moved faster than trucking to adopt ICT. Given the dearth of published literature on ICT diffusion in other transport modes, specific details are more difficult to report. Nevertheless, the use of ICT by other commercial transport modes is likely to have impacts similar to those experienced in freighttrucking activities.

One of the most important aspects of ICT – common to all transport modes – is pre-trip planning and scheduling. For

consumers, this involves using ICT services such as the Internet to gather information about schedules, accommodation and entertainment, and to plan and book trips. In commercial transport operations, pre-trip planning and scheduling involves the use of ICT optimization and expert programs and their associated databases to optimize planned routing, scheduling and other logistic and management operations (payroll, personnel), as well as to minimize costs.

As with the freight-trucking activities, the other modes of transportation also have access to three main types of applications of ICT.

- computerized planning, scheduling and administration through optimization programs;
- real-time tracking of vehicles and cargo; and
- the use of EDI for administrative and financial document transmission, as well as for electronic markets.

#### ICT use in Rail Transport

With ICT diffusion, the main distinction between rail and freight-trucking has been in the ownership and nature of the infrastructure used in each mode. Private ownership dominates rail infrastructure, while public ownership dominates road infrastructure. Rail infrastructure is also more compact, with a limited number of users, compared with the larger and more diffused road network used by many commercial and private users.

These infrastructure differences may have contributed to the adoption of ICT technology in rail operations. This is supported by the productivity gains associated with steep cuts in employment in the Canadian rail industry in the 1990s, as discussed in Chapter 8, Transportation and Employment and Chapter 16, Price, Productivity and Financial Performance. While these impressive productivity improvements are fueled by many factors, a good part of the credit goes to ICT 12.

The ownership characteristics and relative concentration of rail infrastructure and rolling stock allow for the use of simpler tracking technologies. For example, the rail mode can use automatic car or locomotive identifiers such as bar codes and transponders, with readers attached to infrastructure, but trucking requires a global positioning system (GPS). When the Union Pacific Railway in the US wanted to track its trains using ITS, it simply installed bar codes in the cars and fibre-optic cables along the tracks, improving on-time success rates from 48 to 94 per cent 13. West Coast Express, a British Columbia, Canada-based commuter rail service company, has equipped its locomotives with a GPS-based tracking system. This enables them to monitor trains. keep passengers informed of delays, and better share the tracks of CP Rail.

The main applications of ICT in today's Canadian rail freight 12:

- · radio and signals
- · rail traffic dispatch and control
- automatic equipment ID and tracking
- · electronic commerce
- · shipment management

- inter-line systems with North American railroads
- · mobile computing and
- · data warehousing.

Future investments in ICT<sup>12</sup> are projected to include:

- Internet
- satellite
- advanced train control
- · high-speed wireless
- · expert/simulator systems
- seamless interaction with all modes, customers and suppliers.

In the case of passenger rail, many of the same ICT uses can be expected. Furthermore, the development of a relatively new high-speed passenger rail transport technology—magnetic-levitation (mag-lev)—may be able to compete with the automobile, airpassenger transport, and older high-speed rail systems such as France's TGV and Japan's Shinkansen systems. Mag-lev systems could resemble high-speed, large geographic-scale subway systems.

The mag-lev system currently on a drawing board in Japan (typically the most advanced country in terms of introducing public transport technology) suggests mag-lev's potential, and its association with ICT. The Hitachi corporation's Energy Research Lab are "dreaming up a new train...that makes the Shinkansen seem like a steam engine. Swapping ideas over a high speed computer network with engineers at a half dozen other Hitachi labs, they're pooling knowledge in chips, advanced

materials, super-conductivity and software. Already they have a magnetic-levitation prototype that whooshes down a guideway at 300 mph on a cushion of air... Their goal is a nation wide mag-lev system controlled by a huge computer network that will behave like a living organism. Jobs such as scheduling and driving now done by humans will be surrendered to intelligent software, which will also untangle tie-ups, and adjust the flow of transport. It is a transportation system so vast and complex that no single Hitachi executive has a handle on the entire blueprint" (Businessweek, 1992)14.

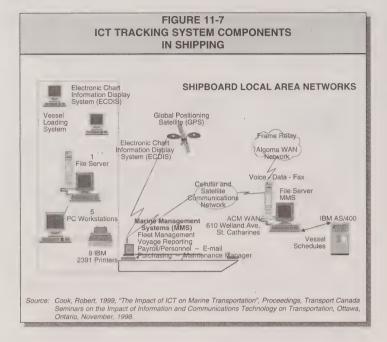
The implementation of mag-lev technology will depend on its proponents' ability to solicit the scale of public funding that has always been needed to implement all large, new transport infrastructure, from railways in the nineteenth century, to airports, air navigation systems, highways and road-infrastructure in the 1950 and 1960s. It will be no different for the ITS technology of today.

And, as with urban transit, the question of public investment in passenger rail also falls into the public policy debate. Put simply, the issue will focus on whether to continue supporting increased road use through public investment in roads and ITS technology, or to constrain road use through the re-allocation of public investment to alternative modes.

<sup>12</sup> Foster, Anthony, 1999, "The Impact of ICT on Rail and Intermodal Transport", Proceedings, Transport Canada Seminars on the Impact of Information and Communications Technology on Transportation, Ottawa, Ontario, November, 1998.

<sup>13</sup> Tapscott, Don, 1996, The Digital Economy, Promise and Peril in the Age of Networked Intelligence, New York, McGraw-Hill.

<sup>14</sup> Gross, Neil, 1992, "Inside Hitachi", Business Week, September 28.



#### ICT use in Marine Transport

Use of ICT in marine-freight transport can be divided into two main areas: ICT used by shipping companies, and ICT used in marine infrastructure, such as ports or canals.

Shipping companies use realtime ICT for automatic shiptracking systems that rely on satellite technology for GPSs, combined with electronic digital charts, as well as two-way digital communication from ship to shore. These systems make it possible to track ships in real time, both from shore and from sea, and to calculate optimal routing and scheduling.

Figure 11-7 illustrates the different ICT tracking and information components of one Canadian shipping company.

Marine infrastructure's main use of real-time ICT and electronic data processing systems is for tracking and optimizing the movements of ships and cargo, especially within a port or canal. It also uses this technology to optimize: loading and unloading by allocating berths and cranes; storage (particularly in container yards); and cargo pick-up and delivery by other freight modes, (rail, truck) at a port's gates.

In ports, particular emphasis is placed on container management and tracking, with some potential for the use of transponder-based technology, similar to that described earlier for trucking. However, an interesting problem related to real-time container tracking is the requirement for all transport companies to install standard identifiers, such as bar codes and transponders, on containers. Another interesting problem is the need to locate interior containers in densely packed container storage yards, with spread spectrum technology being explored to solve it.

EDI systems have been and are being implemented to allow for communication between marine shipping companies and brokers, marine infrastructure (ports) and other freight modes such as rail, allowing for seamless intermodal freight transfers.

#### **ICT Use in Air Transport**

As with marine and rail, ICT diffusion in air transport has been relatively rapid. The vast majority of both air navigation infrastructure suppliers and large commercial airlines now use GPS-based satellite tracking, allowing for ongoing consolidation of air traffic control infrastructure. (See Chapter 12, Transportation Infrastructure). Expert programs and EDI systems are also used for administering, routing, scheduling, and other management functions, and by maintenance personnel. Indeed, the airline industry is one of the most advanced of all industries in using EDI for electronic commerce to directly retail products such as airline tickets.

The airline industry's rapid adoption of electronic commerce may be a harbinger of similar moves to electronic markets in other transport industries, such as truck and rail-freight, where it is still relatively new. During the airline industry's early forays into EDI, there were no electronic connections between the airlines and their brokers, the travel agents. By the second stage, brokers and producers had become connected through computer reservation systems (CRSs) containing electronic information on different airlines products (e.g. fares and schedules), but consumers were still outside the loop. Now, both CRS-equivalent systems, such as Cheap Tickets Inc., and individual airlines are on

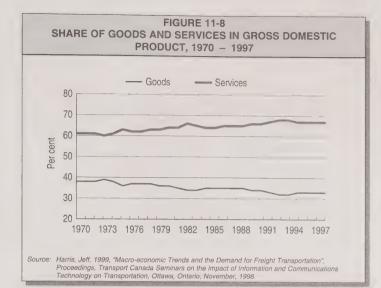
the Internet, allowing for increasing amounts of direct sales between producer and consumer. This development has reduced or eliminated the role and costs associated with a physical intermediary, the broker. Direct electronic communications allow the airline industry to move towards personalizing relationships between industry and consumers, a change that may become the hallmark of the ICT era.

Direct electronic sales of tickets and other products (e.g. air mile rewards) allows the airlines to develop detailed, individual databases on specific consumer tastes and buying patterns. Over time, they can use this information to customize products and services to maximize revenues and minimize costs, as well as improve customer service and satisfaction.

## ICT'S IMPACT ON TRANSPORTATION DEMAND

## THE IMPACT OF ICT ON COMPLEMENTARY INDUSTRIES TO FREIGHT TRANSPORT

Freight transport is complementary to the goods-producing industries. It also complements the wholesale and retail trade that support these industries. Freight transport is an intermediary industry whose primary function is to move goods to production facilities and manufactured goods to wholesale and retail markets. Consequently, freight transport's importance to the economy is highly correlated



with the relative importance of the goods-producing and trade industries' importance to the economy.

## Macro-Economic Trends in Goods and Services Production

Recent macro-economic analysis predicts that the modern knowledge-based economy will see a decline in the importance of goods-producing industries and growth in service industries.15 The decline is more in the relative importance than in actual volume moved. The time period since the last recession (or from 1992 onwards), however, demonstrates the contrary: that is, solid growth in goods-producing industries, with goods-producing industries increasing their share of GDP in relation to services.

Figure 11-8 illustrates this phenomenon.

A more detailed look at the five leading growth sectors from 1972 – 1997, is shown in Table 11-3, which is roughly broken down into periods between recessions (1992 – 1997, 1982 – 1992, 1972 – 1982).

Table 11-3 indicates that the three complementary industries to freight transport (primary commodities, manufacturing and trade) rank respectively third, fifth and fourth in growth over the latest time period. The leading growth industries in all three time periods (communications, business and services) contain primarily ICT industries such as telecommunications and software companies.

Table 11-4 gives an assessment of growth in transport industries over the same time periods. It points out a correspondingly high growth in primarily freight-transportation industries (trucking, rail and marine) over the latest time period. The negative and low growth in passenger transport (such as intercity bus and urban transit) and other transportation (such as travel agents and freight forwarders) may reflect the social

<sup>15</sup> Examples of these analyses from a comparative international perspective are primarily from the OECD, and domestically from Industry Canada, with these studies generally set in the time period from 1971 to the early 1990s.

TABLE 11-3 LEADING GROWTH INDUSTRIES 1972 – 1997								
R	1972 – 1982	1982 – 1992	1992 – 1997					
1	Business Services	Communication	Business Services					
2	Communication	Business Services	Communication					
3	Health and Social Services	Trade	Manufacturing					
4	Other Utilities	Financial Services	Trade					
5	Construction	Health and Social Services	Primary Commodities					
Source: Statistics Canada, Cansim								

ANNUAL GROWTH IN COMME	TABLE 11-4	CODTATION	INDUSTRIES					
1972 – 1997								
	1972-1982	Per cent 1982-1992	1992-1997					
Transportation Industries	2.2	2.4	2.4					
Rail	-1.6	4.1	4.3					
Marine	2.3	-0.4	2.7					
Truck	3.5	4.8	5.6					
Primarily Freight	1.5	3.6	4.8					
Air	5.1	0.0	3.0					
Passenger Transit Systems	2.1	-2.2	-3.4					
Other Transport	2.7	1.4	-2.6					
Primarily Passenger	2.9	-0.5	-1.4					
Source: Statistics Canada, Cansim								

trends referred to earlier in this chapter, such as heightened automobile use and electronic commerce for direct ticket purchases.

While it is important to be cautious in explaining the observed trends, it is possible that non-ICT-related economic factors were responsible for the services growth from 1972 to 1992. Other such factors could include the energy crisis (1972 – 1982), public policy decisions related to deficit financing and growth in government services, or the ever-

increasing participation of women in the labour force. It is also possible that the 1990s represent the initial phase of the new ICT-based economy, where the continuation of the observed trends from 1992 to 1997 in goods-production and trade may lead to an increase in the importance of freight transportation to the Canadian economy.

## **ICT and Industrial Processes**

A shortage of data makes it difficult to observe the impact of ICT on industrial production processes, and therefore to assess whether these processes create a complementary demand for freight transport. It is possible, however, to speculate that the principal impacts will come from the new supplychain management that integrates production, distribution and retail through common EDI systems.

Freight transportation is crucial to this new supply-chain management, with transport being the prime intermediary among industries using the just-in-time (JIT) processes. JIT integrates production, shipping and sales to streamline delivery and eliminate or minimize inventory accumulation through interconnected EDI systems.

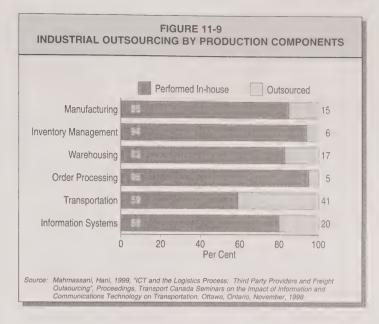
Wal-Mart is a good example of JIT delivery. At Wal-Mart, an EDI network links retail stores, redistribution centres, suppliers and manufacturers with transportation industries. All information (sales history, number of items in transit) is digitized and maintained in a common database. to which floor retail staff ("associates") have access through a bar code scanner and display read-out. The floor-level associate responsible for a given section, such as household wares, places the order. The order is then transmitted through the common network directly to suppliers, redistribution centres and transport firms. The supplier who receives the order ships it to the redistribution centre, where the goods are transferred from the supplier-delivery loading dock to the retail-store shipment dock, with minimal (24-48 hrs) transshipment time to the retail store. The result: 97 per cent of Wal-Mart's goods never pass through a warehouse, and Wal-Mart can pay suppliers directly through customer sales 16.

16 Tapscott, Don, 1996, The Digital Economy, Promise and Peril in the Age of Networked Intelligence, New York, McGraw-Hill.

## JIT in manufacturing

In manufacturing, a JIT process is now common, but moves back through the production chain to intermediate and primary commodity producers. Car manufacturing plants, for example, are linked to parts suppliers by ICT networks. Each time a new car rolls off the assembly line, it is automatically registered by the parts supplier through a common EDI system, which then manufactures and ships the parts "just in time" to meet the demand from the plant. Again, warehousing is eliminated, reduced or transferred from the manufacturer to the supplier. Account settlements, transfer of designs and drawings, email and other business transactions between the automakers and their supply sidetracking partners are now done through an integrated ITC network.

For some suppliers, JIT delivery may result in changes in the average load weight and number of trips a transportation mode must provide. JIT may, for example, increase the number of trips. It may also be more conducive to truck transport, as freight trucks have lower capacity per unit, come in varying sizes, and have more dispatch flexibility than rail and marine transport. Consequently, the impact of JIT may be to increase the demand for freighttrucking relative to other freight modes. However, given the limited availability of data on the composition of the trucking fleet and of private trucking activity, these projections must be seen as conjecture.



## Outsourcing

One of the principal effects of ICT is that it reduces transaction costs, because fewer people are needed to manage and process a company's services. As a result, employers have begun to contract specific services to suppliers, rather than maintaining their own staffs. In the case of freight trucking, ICT allows for better information on freight logistics and performance (such as proportion of on-time delivery). Firms that need to transport their products to their markets are therefore beginning to contract out freight and all other logistic operations, rather than maintaining in-house staff.

Figure 11-9 shows that, of all components of industrial production, transportation currently has the largest share of outsourcing.

Large numbers of multinational corporations (Toys R Us, Scott Paper) are now outsourcing all of their logistics to the specialized logistics units of large transport firms. These firms have the ICT expertise to implement, manage and coordinate the various JIT logistics processes, including subcontracting to various transportation firms<sup>17</sup>. Advantages of using third-party logistics providers include:

- leveraging freight volumes for lower transport rates;
- spreading warehousing and equipment costs over a larger base, and maintaining higher utilization;
- better utilizing staff, equipment software and other resources;
- excelling through specialization;
   (e.g. by recruiting better logistics personnel, keeping up with new technology; and better

<sup>17</sup> Miles, Gregory, 1995, "Marriages of Convenience; New Age Logistics Units Woo Customers via Information Technology," *International Business*, January, pp 32–36.

## TABLE 11-5 TRUCK DRIVERS EMPLOYED BY INDUSTRY

Sector	1991	Per cent	1996	Per cent	Annual Growth
Commercial Transport	88,805	49.4	120,570	59.6	6
Own-Account	91,125	50.6	81,810	40.4	-2
Total	179,930	100.0	202,380	100.0	2

Source: Statistics Canada, Census Data

integrating various players along the supply chain<sup>18</sup>).

In Canada, some interesting evidence of this shift from private to commercial transport is provided by data on truck drivers employed in private and commercial trucking operations from 1991 to 1996, shown in Table 11-5. This is another possible explanation for the high growth in commercial trucking noted in Table 11-4.

## TRANSPORTATION AND TELECOMMUNICATIONS<sup>19</sup>

Much of the literature that has been written on the relationship between transportation and telecommunications focusses on whether transportation and telecommunications are substitutes for or complements to one another. This section looks at that literature in four sections: econometric studies, telecommuting, video-conferencing and other (i.e. teleshopping) studies.

Much of the literature dealing with the relationship between transportation and communications confuses two economic concepts: the concept of substitute/ complementary goods, and the concept of normal, inferior and superior goods.

"Substitutes" and "complements" refer to goods with a direct relationship, where changes in relative prices will affect demand. For example, an increase in the price of one good (e.g. an automobile) generates an increase in the demand for another good (e.g. Internet access), indicating they are substitutes (e.g. fewer automobiles, more Internet access).

"Normal," "inferior" and "superior" goods refer to changes in demand due to changes in income.

With normal goods, demand increases as incomes rises; with inferior goods, demand falls as income rises; and with superior goods, demand increases

proportionally more than the rise in income. As an example, a common error in the literature assumes that, because both telecommunications and transport activity have increased over time, they are complements. Actually, as real income has also been rising over time, the observation probably indicates that they are both normal or superior goods.

### **Econometric Studies**

A very interesting study conducted over approximately 25 years in England and Australia<sup>20</sup> analyzes the household demand for both consumer transportation (e.g. cars, buses) and communications from 1960 to 1986. While the study pre-dates the period we are interested in – the 1990s – it still offers signposts to current trends.

The study indicates that rising real income is the main factor that determines changes in the demand for both transport and communications, with a very slight substitute relationship between the two.

The principal results of the study can be seen in Table 11-6.

The data<sup>20</sup> indicate that the main impact on both transport and communications demand comes from rising real incomes rather than relative price changes. Private transport (such as the automobile) is highly income-elastic<sup>21</sup> in both countries, indicating private transport demand is particularly

- 18 Mahmassani, Hani, 1999, "ICT and the Logistics Process: Third Party Providers and Freight Outsourcing", Proceedings, Transport Canada Seminars on the Impact of Information and Communications Technology on Transportation, Ottawa, Ontario, November, 1998.
- 19 This entire section draws heavily on Mokhtarian et al., 1997.
  Mokhtarian, Patricia, Ilan, Salamon, 1997, "Emerging Travel Patterns: Do Telecommunications Make a Difference", prepared for the eighth meeting of the International Association of Travel Behaviour Research, Austin Texas, September, 1997.
- 20 Selvanathan, E. and Saroja Selvanthan, 1994, "The Demand for Transport and Communications in the United Kingdom and Australia", Transportation Research B, 28(B)(1), pp. 1-9.
- 21 The degree to which demand changes in relation to increasing real income is measured through an economic concept called "the income elasticity of demand." Income elasticity measures the proportional change in quantity demanded for a good relative to proportional changes in real income. A good with an income elasticity of greater than one is referred as an "income-elastic" or "superior (luxury)" good, meaning its consumption rises proportionally faster than does real income. A good with an income elasticity between 0 and one is inelastic, while a good with a negative income elasticity is an inferior good.

## TABLE 11-6 INCOME AND PRICE ELASTICITIES FOR TRANSPORT AND COMMUNICATIONS UNITED KINGDOM AND AUSTRALIA, 1960 – 1986

		United Kingdom				Australia			
	Income Elasticity				Income Elasticity	Price Elasticity			
Goods		Private Transport Tr		Communi- cations		Private Transport	Public Transport	Commun- cations	
Private Transport Public Transport	2.11	53 .19	.07 41	.08	2.27	55 .49	.15 73	.04	
Communications	1.19	.57	.09	12	.50	.31	.18	60	

Source: (Selvanathan, E. and Saroja Selvanthan, 1994, "The Demand for Transport and Communications in the United Kingdom and Australia", Transportation Research B, 28(B)(1), pp. 1-9

responsive to rising income, rising proportionally much faster than real income over time.

Communications demand is income-elastic in the United Kingdom, while the demand for private and public transport is income inelastic. All price elasticities (own, cross-price) are inelastic, indicting that demand is relatively unresponsive to price changes, with a very low crossprice elasticity 22 from communications to transport. The positive sign indicates a very slight substitution effect. This may not be particularly surprising, as transportation (moving people and goods) and communications (exchange of ideas) may serve primarily different purposes in society.

A different study <sup>23</sup> assesses whether commercial transport and telecommunications services purchased by industry are correlated. This study is based on a cross-sectional analysis of commercial transport and

telecommunications inputs into 44 industries, for nine countries of the European union in 1980. The study finds that commercial transport and telecommunications are positively correlated, indicating that industries that purchase large amounts of commercial transportation also tend to purchase large amounts of commercial telecommunications services.

## ICT and Telecommuting 24

Public interest in the relationships among commuter transport and urban congestion, public infrastructure costs and pollution has resulted in a number of studies that examine how telecommuting could mitigate some of these problems. The studies are of two types: small-scale empirical studies of travel behaviour by telecommuters, and larger projections that amplify the results of the smaller studies.

The small-scale telecommunications studies

compare transport activity by telecommuters on days when they commute to an office with transport activity on days when they work at home or from telecommuting centres. Much of this early work was related to environmental considerations, and many of the studies also include estimates of changes in fuel consumption, particularly for private vehicles.

These studies have relatively small samples, and are short run, meaning that they do not follow a cohort of telecommuters long enough to check whether the telecommuters' patterns for house and vehicles purchases changed. The results of the small studies are consistent, if unsurprising. They demonstrate that telecommuters traveled fewer kilometres on telecommuting days, which suggests a short-run substitute relationship between telecommuting and transport. The studies also indicated, again unsurprisingly, a slight tendency

- 22 The degree of substitutability or complementarity is judged by an economic concept called "the cross-price demand elasticity." This elasticity measures the proportional change in demand for "Good A" (e.g. transport) relative to a proportional change in the price of "Good B" (e.g. telecommunications). If the elasticity is negative the goods are substitutes; if positive, complements. The size of the elasticity indicates how closely the goods are related. An elasticity of zero means they are not directly related.
- 23 Plaut, Pnina, 1997, "Transportation-Communications Relationships in Industry," Transportation Research A, 31 A, pp. 419-425.
- 24 Shafizadeh, Kevan; Debbie Niemeier, Paticia Mokhtarian, Ilan Salomon, 1997, "The Costs and Benefits of Telecommuting: An Evaluation of Macro-scale Literature", paper presented at the eighth meeting of The International Association of Travel Behaviour Research, Austin, Texas, September, 1997

TABLE 11-7						
LARGE SCALE	<b>TELECOMMUTING</b>	<b>FORECASTS</b>				

Selected variables	DOT study (1992 - 2002 annual average)	DOE study (2005, 2010 annual average)
Vehicle mile savings (billions)	1,583-2,097	2,047-2,319
Fuel savings (million gallons)	100-134	46-69
Fuel cost savings (million \$)	\$ 86 -114	\$ 51- 77
State and Federal Excise Tax		
Loss (million \$)	\$ 24-32	\$ 14- 21
Avoided CO2 emissions (tons)	37,971 - 50,293	3,398 - 8,817
Avoided NOx emissions (tons)	4,557 - 6,036	620 - 1,903
Avoided Hydro-Carbon		
emissions (tons)	5,602-7,421	521 - 1,081

Source: Shafizadeh, Kevan; Debbie Niemeier, Paticia Mokhtarian, Ilan Salomon, 1997, "The Costs and Benefits of Telecommuting: An Evaluation of Macro-scale Literature", paper presented at the eighth meeting of The International Association of Travel Behaviour Research, Austin, Texas, September, 1997.

for reduced use of urban transit mode.<sup>25</sup>

The results of these studies have served as the basis for larger projections of potential telecommuting benefits, primarily at the national level in the United States. The two principal US studies are by the US Department of Transport<sup>26</sup> (DOT) and the US Department of Energy<sup>27</sup> (DOE). To generate projections of variables such as travel activity, fuel use and emission reductions, these larger studies rely on assumptions regarding increases in the number of individuals who would telecommute, the number of days per week they would telecommute, and reductions in private-vehicle travel on telecommuting days.

These studies – particularly that carried out by DOE – also attempt to quantify some of the benefits associated with the projected reductions in transport activity. Table 11-7 summarizes roughly comparable results for low- and high- range results. The divergence between the studies is largely explained by differing assumptions regarding fuel efficiency.

The DOE study bases its estimate of the total financial benefits from telecommuting through avoided expenditures in road-infrastructure capacity of \$12,970 - \$19,960 million from 1994 to 2010, for an average annual savings of \$811 - \$1,248 million dollars.

To place these results in perspective, the high estimate of annual fuel savings from the DOT study presented above represents approximately 0.1 per cent of gasoline consumption in the United States in 1993 (111,323 million gallons). However, the high estimated cost savings in annual road infrastructure from the DOE study represents approximately 1.8 per cent of total public expenditures on roads in 1993 (\$69.6 billion). The discrepancy in the percentages may reflect the disproportionate influence of peakhour commuting on road infrastructure costs, particularly capacity costs.

An interesting and similar result is found in a Canadian financial cost-benefit study of the greater Vancouver Area done as a Masters thesis.28 The study finds that benefits outweigh costs for the three sectors of public, employers and employees. The principal beneficiary of telecommuting is the public sector, which can reduce expenditures on highway infrastructure. Suggested infrastructure cost reductions are based on estimates of future transport infrastructure costs relative to peak-hour commuting trips.

Table 11-8 indicates the distribution of net benefits.

The results of all these macro studies cited above should be used with caution, for two reasons.

- 25 Mokhtarian, Patricia, 1998, "A Synthetic Approach to Estimating the Impacts of Telecommuting on Travel", Urban Studies, 35 (2), pp. 215-241.
  - Mokhtarian, Patricia; Susan Handy, 1996, "Forecasting Telecommuting; An Exploration of Methodologies and Research Needs" Transportation 23, pp. 163-190.
  - Salomon, Ilan, 1998, "Technological Change and Social Forecasting: the Case of Telecommuting as a Travel Substitute", Transportation Research C 6, pp. 17-45.
- 26 US Department of Transportation, 1993, Transportation Implications of Telecommuting, Washington, D.C.
- 27 US Department of Energy, 1994, Energy, Emissions and the Social Consequences of Tele-commuting, Washington, D.C.
- 28 Finlay, Stephen, 1991, "Benefits, Costs and Policy Strategies for Telecommuting in Greater Vancouver" master thesis in Business Administration, Simon Fraser University, Vancouver, British Columbia.

First, they use a large number of relatively arbitrary assumptions to generate results; second, they rely solely on short-run telecommuting studies for their estimates of travel activity reductions. Nevertheless, the studies do point to two probable conclusions. One is that short-run reductions in total surface passenger travel activity due to telecommuting will be relatively small<sup>29</sup>; the other is that reductions in peak-hour commuter travel activity may be more substantial, with financial benefits primarily related to avoided costs for highway infrastructure.

## ICT and the Air Transport Market

Another major transportation market where ICT technologies and transport compete is the business air-travel market, where teleconferencing, video-conferencing and network-linked email have the potential to replace air travel. Certainly, ICT providers have consciously targeted the business-travel market — an apparently logical choice, since most business people travel to communicate.

Unfortunately, there are no comprehensive econometric studies of the business air-travel market that estimate the various elasticities, such as price and income, associated with ICT products and commercial air transportation. Early studies that used either surveys-methodology or case studies generated mixed results in terms of a substitute or a complement relationship. A modern Canadian study that used survey techniques on business travelers and business video-

## TABLE 11-8 SECTOR DISTRIBUTION OF NET FINANCIAL BENEFITS FROM INCREASED TELECOMMUTING IN GREATER VANCOUVER

Present values in millions of 1991 Canadian dollars

Sectors	Zero Traffic Growth Scenario	Reduced Traffic Growth Scenario
Public Sector	1,546	637.1
Employers	85.4	46.8
Telecommuters	136.8	73.9

Source: Shafizadeh, Kevan; Debbie Niemeier, Paticia Mokhtarian, Ilan Salomon, 1997, "The Costs and Benefits of Telecommuting: An Evaluation of Macro-scale Literature", paper presented at the eighth meeting of The International Association of Travel Behaviour Research, Austin, Texas, September, 1997

conferencing users indicates a substitute relationship.

Figure 11-10 projects the increase in business air travel substitution over time, beginning in 1996.

## ICT and Other Passenger Transport Markets

While the commuter and air transport markets have the highest potential for direct competition between ICT and transport, other areas of potential competition have also been suggested, notably teleshopping and various forms of conventional and mobile telephones.

While there are no empirical studies in the area of teleshopping, the nature of shopping suggests limited substitutability. Shopping is not done primarily to communicate, but to purchase and transfer goods from a retail location to a household. While the search-and-purchase process may take place though the Internet, in most cases, the physical movement of goods must still follow.

The increase of teleshopping may, however, change the modal

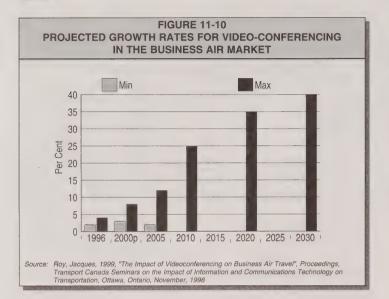
distribution of shopping travel from private vehicles to freight trucks or delivery vans. The Octopus book firm, for example, serves as both an on-line book dealer and a delivery service. The high growth in the courier services market may also be further accentuated by the growth in on-line shopping.

Two specific empirical surveys have looked at the relationship between telephones and transport. A week-long 1984 diary study in the Lyon, France, metropolitan area involving 663 people estimated that residential phone use generated trips between three and five per cent of the time, and replaced trips between 21 and 27 per cent of the time.30 A mail survey of 7,347 cell-phone subscribers in the San Francisco Bay area found that 14.8 per cent of respondents reported driving less often after getting a cell phone, compared with eight per cent who reported driving more often.31 While these results should be interpreted with caution, they do confirm the results of the Selvanthan study cited earlier, which indicates a

<sup>29</sup> Mokhtarian, Patricia, 1998, "A Synthetic Approach to Estimating the Impacts of Telecommuting on Travel", Urban Studies, 35 (2), pp. 215-241.

<sup>30</sup> Claisse, Gerard; Frantz Rowe, 1993, "Domestic Telephone Habits and Daily Mobility", Transportation Research A27(A), pp. 277-290

<sup>31</sup> Yim, Youngbin, 1994, "The Effects of Mobile Telephones on Transportation and Urban Form", paper presented at 33rd annual meeting of the Western Regional Science Association, Tucson, Arizona, February 2-27.



relatively weak substitute relationship between consumer transport and conventional telecommunications such as the telephone.

## SUMMARY

This chapter has reviewed some of the empirical work on the impact of ICT on transportation, based on a research project undertaken by Transport Canada in 1998.

In summary, the possible impact of ICT on passenger transportation may be to further augment the use of the automobile as the principal means of surface passenger transportation. The congruent effects of increasing urban sprawl and a declining peak daily flow; increased road capacity through ITS; and ICT-induced rising incomes, may in combination overwhelm the slight potential substitution effect from telecommuting.

In air travel, the impact of video-conferencing may generate some stagnation in the business air market.

With freight transport, conclusions are more difficult to draw, as the economy may be on a new and different growth path in the 1990s relative to the previous 20 years. Certainly freight transportation growth has been strong since the end of the 1992 recession, with particularly strong growth in trucking and rail, corresponding to growth in the goods-producing and trade sectors. Lack of data makes it more difficult to discern the impact of ICT-based supply-chain management and JIT production processes. There is, however, some evidence that companies are increasingly contracting out commercial transport rather than handling it themselves.

In terms of freight supply, all modes should experience increased efficiency and lower costs due to ICT investment, which should result in lower freight prices and gradual implementation of electronic freight markets that will in turn generate heightened price competition.

Modal shifts are harder to discern, due to the lack of data on relative ICT diffusion and related productivity gains by mode.



# Transportation, Infrastructure AND Services

A country's transportation system rests on transport infrastructure assets without which transport services could not be offered. So before reporting on the level of activities for each mode of transportation, this section gives an overview of the infrastructure system. It looks at changes affecting or that could affect directly or indirectly the country's transport infrastructure. Next it presents the infrastructure system and its use. It also conducts an analysis of some incidental services, because of their importance to safety and/or system efficiency. When possible, this section reviews some traffic and financial information. A section on the industry structure prevailing in each modes of transportation follows. This examines the recent changes to the structure of each modal transport industry. To make the coverage of transportation complete, it then analyzes measures of transport activity levels, by modes, with a focus on both freight and passenger transport. The report ends with one of the important concern of transportation policy, economic efficiency. Efficiency is examined from the perspectives of price, productivity and financial performance of the modal transport service industries.

## Transportation Infrastructure

Canada's transportation infrastructure is affected by policies aimed at modernizing the system. In 1998, changes to infrastructure occurred through investments improving or adding services and through rationalization, transfers, changes in ownership or in the operators.

Efficient, modern transport services require a sound infrastructure composed of many interconnecting elements. Without rails, there are no trains. Without airports, aircraft cannot take off and land. Without roads, cars, trucks, and buses cannot circulate. Without ports, ships cannot moor or be loaded and unloaded.

This chapter describes the status of the essential elements of the infrastructure that supports the portion of Canada's transportation system that moves both passengers and freight. It also describes events and issues of the past year

that involved management of the assets of Canadian infrastructure components, such as the operation of airports, air navigation, ports, the Seaway, railways, roads and bridges. In addition, this chapter discusses related services such as marine pilotage, freight forwarders and warehouse operators.

This is the first annual report to include freight forwarders and warehouse operations. Both have become important components of transportation, especially in relation to trade, and we hope to expand that coverage in future years.

Canada's transport infrastructure must be viewed within the context of its transport policy framework. Current policies encourage the use of "best practices" to make the system more cost-effective. The events of 1998 represent in large part the privatization and accompanying commercialization of Canada's transportation system, which in turn resulted from the government's strategic rethinking of the management and delivery of infrastructure-related services. A number of initiatives in 1998 have had an impact on infrastructure and associated services.

	СОМ	TABLE 12-1 PONENTS OF CANADA'S TRANSPORTATION INI 1998	FRASTRUCTURE
Mode	Component	Number & Function	Activity Measure¹
AIR	Air Navigation System	7 area control centres, 44 air traffic control towers, 83 flight service stations, and 1,400 electronic aids to navigation provides air traffic control, flight information, and other related air navigation services	There were 7.6 million aircraft movements at all airports in 1998, with 43.6 per cent occurring at NAS airports.
	Airports	approximately 1800 aerodromes across Canada in all jurisdictions     631 <i>are</i> certified as airports, heliports or water/ice bases for float/ski planes.     enable landing, takeoff, maintenance of aircraft, and handling and servicing of both passengers and cargo	79.5 million passengers used all airports in 1997.     93.5 per cent of passengers passed through the 26 airports that make up Canada's NAS.
MARINE	Ports	more than 2,400 diverse facilities, ranging from large ports like Vancouver to small recreational and fishing harbours     the interface with railways and roads for goods, and passengers that are continuing to their next destination	376.4 million tonnes of international and domestic traffic was handled in 1997.      The top 20 ports handled 79.4 per cent of the total tonnage in 1997.
	St. Lawrence Seaway	water     stretches from Montreal to Lake Erie, consisting of 15 locks, 13 operated by Canada, and 2 by the US     enables vessels to navigate the different elevations of	38.9 and 40.4 million tonnes of cargo was moved in 1998 on the Montreal/ Lake Ontario and Welland sections
		Canadian waterways to reach the open waters of the Atlantic Ocean	respectively.  • Grain, iron ore, coal, and steel products accounted for three-quarters of total traffic, of almost 49 million tonnes in 1997.
HIGHWAY	Roads	more than 900,000 kilometres of public roads, mostly under provincial jurisdiction     24,200 route kilometres built to North American road standards representing the National Highway System and carrying a significant proportion of the vehicle traffic     many border crossings with the United States dotting the countryside, 18 being major gateways and 130 having customs offices	Annual average of 8,400 vehicles per day used the National Highway Sytem across Canada.     The highest counts of average vehicles per day are in Ontario (18,000) and Quebec (14,800).     An estimated 400 million tonnes of freight is moved each year.     10 million truck trips cross the border annually carrying about \$400 billion.
	Bridges	many bridges throughout Canada, 10 of which are vital links in Canada–US trade	<ul> <li>(70 per cent) of Canada-US trade.</li> <li>One third of total vehicle border crossings, or more than 30 million vehicle trips, crossed the bridges in Ontario.</li> </ul>
RAILWAY	Main Lines	72.4 per cent of total railway trackage of approximately 50,100 route kilometres provided CN and CP Rail networks	318 million tonnes were moved in 1997.     CN and CP handle more than 90 per cent of total output.
	Regional and Shortlines	about 51 regional and short lines operating in Canada     51 per cent of the total trackage now controlled by     5 of these shortlines	Regional and shortline rails account for more than 29 per cent of total annual tonnage, or about 9 per cent of total output in revenue tonne-kilometres.
	US Lines  Passenger and Other Lines	368 route kilometres in Canada operated by CSX, Burlington Northern, Conrail, and Wisconsin Central     Passenger trackage of 242 kilometres owned or leased by Via Rail and Go Transit.	88 per cent of all intercity rail travelers (4.1 million in 1998) use Via.     Commuter rail travel (estimated at 29 million passengers in 1998) is in larger urban centres.
			1 Based on the most recent full year of data available

## RAIL TRANSPORTATION INFRASTRUCTURE

In 1998, Canadian railways operated over approximately 50,100 route-kilometres of track, a marginal decrease from 1997. Of this total, CN accounts for about 42 per cent of total system route-kilometres, while CP Rail accounts for about 30 per cent. Over 25 per cent of the Canadian rail network is now owned and/or operated by regional or shortline

railways. Of particular interest is the fact that the growth of shortline rail carriers has continued its strong pace, with an increase of 24 per cent over the previous year in terms of network operated. Based on CN and CP Rail's Three-Year Rationalization Plans, this growth is expected to continue.

Table 12-2 summarizes the ownership and operation of Canada's rail infrastructure.

As a result of rationalization activities (largely transfers to other

operators), CN reduced its network by approximately ten per cent from 1997, while CP reduced its network by about five per cent<sup>1</sup>. The entire network shrunk by about 1.1 per cent during 1998 as a result of discontinuances.

## RATIONALIZATION

Railway rationalization is a broad term referring to the wide range of ways a railway/carrier can deal with track that no longer provides it sufficient economic return. Although once virtually

	COMPON	TABLE 12-1 IENTS OF CANADA'S TRANSPORTATION INFRAS 1998	STRUCTURE - (Cont'd)
Mode	Component	Number & Function	Activity Measure'
RELATED SERVICES	Coast Guard	262 automated light stations, 5 Loran C communication stations, over 6000 land-based, and more than 13,000 floating marine aids     information and other assistance to vessels provided by 22 communication centres and remote transmitter/receiver sites     search and rescue and environmental response provided by 53 stations (22 with in-shore boats and 31 regular) and 63 spill response depots     mission is to support safe and environmentally sustainable	
	Marine	marine transportation  • 4 pilotage authorities:	There were 54,095 total pilotage
	Pilotage	Atlantic — Canadian waters around the Atlantic provinces, Newfoundland & Labrador; including Chaleur Bay, Quebec, south of Cap d'Espoir  Laurentian — St. Lawrence waters between Les Escoumin, and the north gate of the St. Lambert lock, Saguenay River, and Chaleur Bay  Great Lakes — waters in Manitoba, Ontario and Quebec south of the north entrance of the St Lambert Lock  Pacific — covers the coastal waters of B.C. including the Fraser River  • exist solely to provide services that safely guide vessels through their designated waters	assignments in 1998, distributed as follows:  - Atlantic — 9,725  - Laurentian — 22,018  - Great Lakes — 9,085  - Pacific — 13,267
	Freight Forwarders	approximately 280 firms in 170 locations across Canada     transport-related services such as packaging, consolidation, storage, handling, export credits, insurance, documentation, and customs clearance	<ul> <li>Total net sales are well over \$1.5 billion.</li> <li>The percentage of international and domestic services is split at about 60:40.</li> <li>Carrier splits are estimated at 30 per cent for ocean, 26 per cent for rail, 26 per cent for air, and 18 per cent for highway.</li> </ul>
	Sufferance Warehouses	Facilities used by Revenue Canada for customs clearing purposes     currently approximately 1,200 licensed sufferance warehouses across Canada	Revenue Canada estimates close to 5.6 million shipments through these facilities in 1997/98.  1 Based on the most recent full year of data available

Table 12-2 takes into account the effect of leasing to other operators when computing the extent of CN's and CP's networks.

## TABLE 12-2 OWNERSHIP AND OPERATION OF CANADA'S RAIL INFRASTRUCTURE, 1998

	1998 Owned/ Leased Route Kilometers	1997 Owned/ Leased Route Kilometers	Per cent of Total (1998)	Per cent Change Over Previous Year
CN Rail	21,263	23,731	42.4	-10.4
CP Rail	15,034	15,750	30.0	-4.5
Regional and Shortline Railways	13,111	10,586	26.2	23.8
All Others*	686	571	1.4	20.0
Total	50,093	50,638		-1.1

Terminal and switching railways, Canadian subsidiaries of US railroads and passenger and commuter railways

Source: Transport Canada

## TABLE 12-3 CN AND CP RAIL RATIONALIZATION BY PROVINCE 1998

(Route-kilometres)

	(Route-kilometres)								
		B.C.	ALTA	SASK	MAN	ONT	QUE	N.B.	Total
Discontinuances	CP CN		35	234 36	134	32 33			301 204
	Total		35	270	134	66			505
Transfers	CP CN	360	1,029	56		54 491	352	336	415 2,264
	Total	360	1,029	56		546	352	336	2,679

Source: Transport Canada

synonymous with line abandonment, rationalization has come to include such restructuring activities as selling or leasing track and operations to other carriers, establishing "internal" shortlines<sup>2</sup> and discontinuing service<sup>3</sup>. Rationalization is intended to encourage a change in the structure of railway costs and the cost of providing rail service.

Transferring lines to other operators typically results in reduced operating costs (particularly labour) when compared with Class I operations and improvements in the service to shippers on the line.

During 1998, transfers to other operators accounted for most of the rationalization activity, about 84 per cent. In keeping with the

requirements of the Act, those lines that were discontinued, some 505 kilometres of track, were offered first to other potential operators and to governments. Most of the rationalization activity and, indeed, most of the transfer activity, took place in Alberta, with a similar amount occurring in Ontario, Quebec and New Brunswick combined. (See Figure 12-1.)

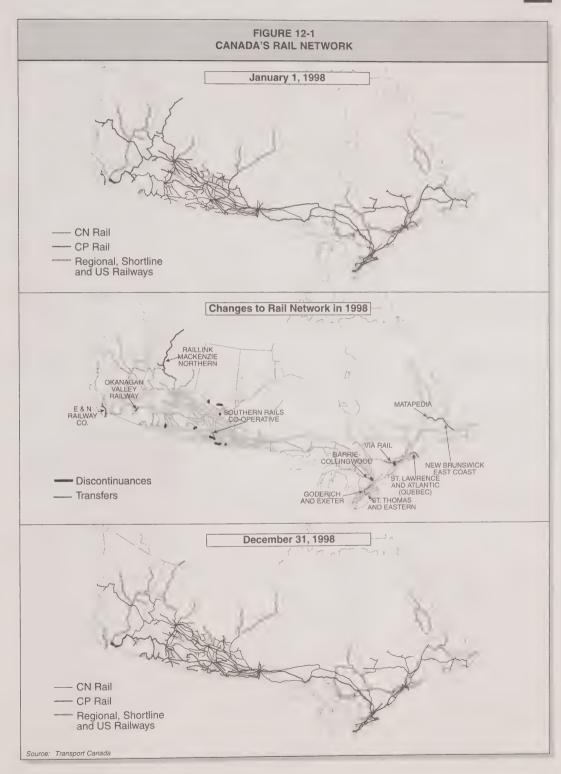
Table 12-3 shows CN and CP Rail rationalization by province for 1998.

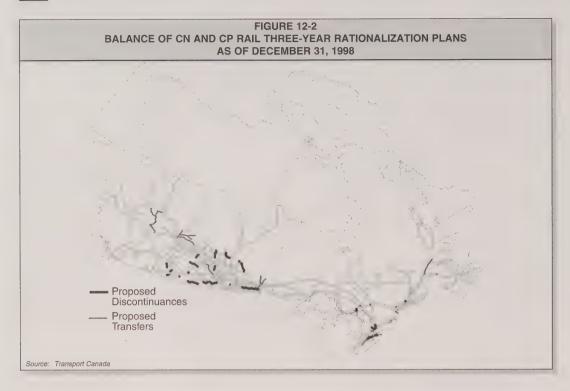
In 1997, eight new railways, operating over some 3,000 kilometres of track, started up. During 1998, the number and operational span of control of regional and shortline railways again increased significantly, as a further nine new railways with about 2,200 kilometres of track began operations. In addition to the formation of new railways, however, about 460 kilometres of track were transferred to existing carriers during 1998.

By carrier, CN accounted for about 85 per cent of all transfers that occurred in 1998. CN dominated this category for two reasons: the transfer of its northern Alberta lines to RaiLink, which now operate as RaiLink Mackenzie Northern; and the fact that it simply undertook more transactions with shortline carriers. Recent transfers of significant stretches of track in Ontario, Quebec and New Brunswick have essentially reduced CN to a spinal network for much of its eastern

<sup>2</sup> Usually considered to be based on flexible arrangements with Class I railway labour to permit sections of track to be operated as though they were shortlines. However, they remain owned by the Class I carrier.

Among other objectives, the Canada Transportation Act, 1996, was intended to encourage the financial viability of railways by reducing the regulatory burden they face, and to facilitate railway rationalization and restructuring by significantly revising the rationalization process. The process is intended to allow the greatest possible opportunity for line retention through transfer to other operators. For those lines over which operations cannot continue, despite providing the opportunity for all interested parties to acquire the lines for continued rail operations, the Act provides for a process under which federal, provincial/territorial and municipal governments are offered the lines. Only after all avenues for continued operation have been explored are the lines discontinued.





Canadian network. CP Rail had previously retrenched in the east to form a spinal system.

Interestingly, of the rail network east of Winnipeg, 64 per cent is represented by CN and CP, while 36 per cent now comprises a system of Class II carriers, with well over half operating as feeders to the Class I system. The balance of the Class II carriers in the east are the legacy regional carriers<sup>4</sup>.

A relatively modest amount of track, about 505 kilometres, was discontinued during 1998. This has followed the general pattern in recent years of far less trackage discontinued than transferred. Still, the amount of track discontinued in 1998 was low even by the standards of recent years. Most of the discontinuances in 1998 occurred in Saskatchewan and most were by CP Rail. In contrast,

most of the transfers during 1998 were from CN.

Figure 12-3 gives a historical perspective on rationalization. It shows that transfers have essentially overtaken discontinuances as the preferred mode of rationalization during the 1990s, slowly at first, but increasingly so since 1996. It illustrates the pattern of discontinuances and transfers in cumulative terms since 1990.

## Three-Year Plans

Under the Act, railways are required to make plans publicly available that outline their rationalization intentions for the next three-year period. The plans are revised periodically. In the remainder of CN's and CP's current three-year rationalization plans, approximately

1,680 kilometres of track are proposed for discontinuance and 2,300 kilometres for transfer. This represents 42 per cent and 58 per cent, respectively, of the total amount of trackage currently proposed for rationalization. Of the total net trackage currently in the plans, 3,144 kilometres (78 per cent) is proposed to occur in the western provinces; of the roughly 1,680 kilometres proposed for discontinuance, about 920 kilometres (55 per cent) is expected to occur in Saskatchewan. (See Figure 12-2)

Table 12-4 shows the outstanding balance of transfers and discontinuances in CN and CP Rail's three-year rationalization plans as of December 31, 1998.

<sup>4</sup> Algoma Central, Ontario Northland, Cartier, Quebec North Shore & Labrador.

## Trends

In 1997, CN and CP operated over some 39,500 route-kilometres, or 78 per cent of the Canadian rail system. By the end of 1998, this had dropped to 36,300 kilometres. or 72.5 per cent. Class II carriers (shortline and regional railways) which had accounted for 21 per cent of the network (on a route-kilometre basis) in 1997, climbed to 26 per cent<sup>5</sup> by the end of 1998. Implementation of the current three-year plans would see CN and CP Rail trackage drop to 67 per cent of the Canadian network and Class II trackage increase to almost one third. For many years, CN and CP Rail directly owned and controlled approximately 90 per cent of the Canadian rail system. This began to change at a modest pace during the early to mid-1990s. It began to change sharply during 1996, in keeping with the marked growth in the number of shortline carriers and the network under their control.

## HIGHWAY TRANSPORTATION INFRASTRUCTURE

## THE CANADIAN HIGHWAY NETWORK

Canada has over 900 thousand kilometres of roads and highways (referred to collectively as "roads" throughout the report). Responsibility for roads rests primarily with the provinces and territories.

The federal government has limited involvement in roads. This covers four areas of activity: ownership of a small amount of federal infrastructure; financial contributions to other levels of government for highway

## FIGURE 12-3 **CUMULATIVE CN AND CP RATIONALIZATION** 1990 - 1998 Kilometres 9.000 8,000 7,000 6.000 5,000 4.000 3.000 2.000 1,000 1990 1991 1992 1993 1994 1995 1996 1997 1998 Discontinuances Transfers Source: Transport Canada

### **TABLE 12-4 CN AND CP THREE-YEAR RATIONALIZATION PLANS** BY PROVINCE, DECEMBER 31, 1998 (Route-kilometres) SASK ALTA MAN ONT QUE N.B. Discontinuances CP 178 490 117 786 CN 429 266 204 899 Total 178 918 266 321 1 1.684 Transfers CP 407 112 154 24 709 CN 993 213 1,596 80 190 120 Total 80 993 407 302 273 237 13 2.305

Source: Transport Canada

<sup>5</sup> The totals do not sum to 100 per cent since a small number of Class III and other railways were not included above.

## TABLE 12-5 CANADA'S HIGHWAY / ROAD SYSTEM DECEMBER 31, 1998

	(2-lane equivalent km)								
Province/ Territory	Total Length	Federal System	Provincial System	Municipal System	National Highway System				
British Columbia	65,728	2,050	42,279	21,399	5,516				
Alberta Saskatchewan	181,437 201,903	3,973 3,181	18,292 26,200	159,172 172,522	3,396 2,085				
Manitoba	87,868	1,740	20,183	64,500	862				
Ontario	167,891	2,346	28,458	137,087	4,924				
Quebec New Brunswick	119,878 21,883	534 218	29,344 18,480	90,000 3,185	2,881 955				
Nova Scotia	25,992	291	23.371	2,330	901				
Prince Edward Island	5,686	56	5,128	502	118				
Newfoundland	13,081	207	8,747	4,127	947				
Yukon	5,069	94	4,697	278	1,092				
Northwest Territories Total	5,487 901,903	390 15.080	4,307 229,486	790 655,892	562 24.239				

1 Route Kilometres

Source: Council of Ministers Responsible for Transportation and Highway Safety;

Transportation Association of Canada

construction; monitoring of international crossings; and research and development.

Municipal governments also have significant responsibility for roads, under various types of arrangements that are specific to each province or territory.

Table 12-5 shows the total length of roads in each province or territory, as well as the amount of road under each jurisdiction.

## Major Highway Projects

Progress was made across
Canada on major highway projects
in 1998. The following list
summarizes major road
construction from information
provided by provincial and
territorial governments to
Transport Canada.

## Newfoundland

In November 1998 the first section of the St. John's Outer Ring Road was officially opened between the Trans-Canada Highway (TCH) near Pitts Memorial Drive and Allandale Road for a distance of 12 kilometres. The second phase will complete the section between Allandale Road and Portugal Cove Road and commence construction in 1999 on the section between Portugal Cove Road and Logy Bay Road. The \$68.2 million Outer Ring Road is to be completed by 2003.

The government of Newfoundland and Labrador is in the midst of a six-year, \$190 million program to upgrade and expand the Trans-Labrador Highway. In 1998, \$28 million was spent on the project's first phase to upgrade the existing road between Churchill Falls and Happy Valley-Goose Bay to a high-standard gravel road.

### Prince Edward Island

The 1.2 kilometre Hillsborough Bridge is a key segment of the Trans Canada Highway (TCH) and National Highway System (NHS) eastward from Charlottetown. A \$21.7 million project involved widening the approaches and the existing bridge from two to four lanes over a distance of two kilometres. The four lane bridge was opened on July 16, 1998.

The Charlottetown Perimeter Highway is also part of the TCH and NHS. The \$4 million, three kilometres project includes a new concrete overpass over Route 236 and extends the Perimeter Highway to Upton Road near the West Royalty Industrial Park. When the project is completed in 1999, it will remove through traffic from two congested intersections and commercial development along the present TCH.

### Nova Scotia

A new, five kilometre, four-lane section of Highway 103 opened on November 3, 1998. This is part of the 17 kilometres, \$22 million Highway 103 twinning project announced in 1997, and scheduled for completion in 2002. Construction of the 15 kilometres four-lane section to TCH 104 continued in 1998. This five-year, \$57 million project will be completed in 1999.

### **New Brunswick**

The Fredericton-Moncton Highway Project, upgrades to the National Highway System and a new Rural Roads Initiative are currently the main focus of the New Brunswick Department of Transportation.

The Fredericton-Moncton
Highway is being built through a
public-private partnership. This
195 kilometre four-lane highway
will be opened and tolled in several
phases. The first toll booth at River
Glade opened in January.
Expenditures on this highway project
are expected to be in the order of
\$200 million in the 1999-2000 year.

New Brunswick is also continuing its NHS upgrading work, focusing on Routes 1 and 2 in the coming year. Work worth \$67.4 million, cost-shared with the federal government under the HIP amendment, will be undertaken in the coming year. On Route #2, work will be completed from St-Basile to Saint Leonard (31.0 kilometres). This will mark the end of a project totalling more than \$95 million which was begun in 1993. A 5.9 kilometre section of highway on Route #2 between Petitcodiac and River Glade (5.9 kilometres) will also be completed. On Route #1, a 15.2 kilometre section of highway from Norton to Sussex will be completed and opened.

By the fall of 1999 there will be continuous four-lane highway in New Brunswick from Lepreau to the Nova Scotia border, except for a short section of the Sussex Bypass.

The provincial government has committed itself to a new program of improvements to the province's collector and local roads, bridges and ferries. Called the Rural Roads Initiative, the program will see and additional \$20 million spent on rural roads, bridges and ferries in 1999-2000.

## Québec

Quebec invested \$27 million (\$23 million in 1998) in the construction of multiple levels at the intersection of Woodland and Morgan on Autoroute 20 in Montreal's West Island. This work was carried out in collaboration with local municipalities. This project will contribute significantly to improve safety in this area.

Major construction programs valued at \$35 million were undertaken in 1998, on a 20-kilometre section of Route 138, east of Quebec City. This project is aimed at separating traffic flows, regularizing access, and realigning many intersections.

### Ontario

In the 1998/99 fiscal year, Ontario allocated \$834 million for highway construction, making it the largest highway construction program in the province's history. This will significantly accelerate the trend started in 1996 to improve the condition of Ontario's highways.

The province is currently engaged in a process to select a concessionaire to assume the 69-kilometre opened portion of the Highway 407 Central, with an obligation to construct two extensions to the highway: the 24-kilometre 407 West, and the 15-kilometre East Partial. If a satisfactory bid is received, a concessionaire will likely be selected in the spring of 1999 to assume full responsibility for construction, maintenance, operation and rehabilitation of the highway, and to set toll rates, collect tolls, and be responsible for highway safety. In the event that appropriate value is not received, then the highway extensions would be completed under a design-build process.

### Manitoba

The 1998 construction program focused on the rehabilitation of the existing provincial highway system. Major construction projects included the completion of the Red River Floodway Bridge, a link in work that is on-going to twin Provincial Transportation Highway (PTH) 59 south from Winnipeg to Ile des Chenes. Work continued on the new PTH 110, which will facilitate through traffic between the Trans-Canada Highway (PTH 1) and PTH 10 and improve access to the industrial area on the east side of Brandon, where a major new hogprocessing plant is under development.

### Saskatchewan

In 1997, Saskatchewan announced the initiative to complete twinning all of the Trans-Canada Highway in Saskatchewan and the Yellowhead Highway from North Battleford to the Alberta Border within 15 years (380 kilometres will be twinned at a cost of \$189 million). In 1998-99 approximately 28 kilometres of the Trans-Canada Highway, west of Gull Lake, was graded at a cost of \$4.1 million. This segment will be paved and opened in 1999. A \$2.5 million contract was started to grade 21 kilometres of the Trans-Canada Highway, east of Indian Head. This contract will be completed during the 1999-2000 construction season.

The province has recently completed construction of the Athabasca Road (Highway No. 905). This project involved construction of a 180 kilometres seasonal road in northern Saskatchewan from Points North Landing to Black Lake at a cost of \$11.7 million. This project was completed with funding assistance from the federal government departments of Fisheries and Oceans, Canadian Coast Guard (\$5.2 million) and Indian and Northern Affairs (\$1.7 million).

## Alberta

Substantial progress was made on upgrading the North/South Trade Corridor in 1998.

Approximately \$90 million in total is expected to be spent on the urban and rural portions of the corridor. Key projects in 1998 include continued four-laning of Highway 4 south of Lethbridge; four-laning of Highway 43 in the Grande Prairie, Valleyview and Whitecourt areas; continued construction of the Winterburn Road/Yellowhead Trail

Interchange in Edmonton; and a kickstart in preliminary engineering on the Ellerslie Road Interchange in Edmonton and the Deerfoot Trail Extension and Interchanges in Calgary.

In September 1998, the department implemented the early tendering of 1999 Primary Highway Construction and Rehabilitation Projects. This initiative will allow the department and the consulting engineering and road building industries to benefit from advanced planning and scheduling for the 1999 construction season.

### **British Columbia**

Major construction initiatives in B.C. during 1998 included continuation of the Vancouver Island Highway project and completion of high occupancy vehicle lanes on the province's busiest highway section, the Trans-Canada Highway through Burnaby and Coquitlam. A major policy initiative to transfer responsibility for some highway sections to local government was highlighted by the impending creation of the Greater Vancouver Transportation Authority, which in April 1999 will assume responsibility for much of the regional road system as well as transit, including a planned major extension of the SkyTrain system.

## Northwest Territories

In the Northwest Territories, work continued on the reconstruction and paving of the 530 kilometre long Highway 1 and 3 route between the Alberta Border and Yellowknife. In 1998, the NWT Department of Transportation will spend \$11.8 million on this project including a design-build contract. To date 440 kilometres of the route have been completed at a total cost of \$117 million.

The Territorial Department of Transportation is also undertaking a \$2 million initiative to assemble background information related to four new road corridors. The four road projects to be studied are the Slave Geologic Province Transportation Corridor, Mackenzie Valley Highway Extension, Inuvik to Tuktoyaktuk Road, and Highway 3 Accelerate Reconstruction Rae to Yellowknife, Studies will be undertaken in the areas of economic impact, financing, engineering and environmental with the hope of attracting new public and private sector investment in new road development.

### Yukon

Work on the US funded Shakwak Project to reconstruct 520 kilometres of the Haines Road and Alaska Highway continued in 1998. Expenditures of over \$8 million produced 14 kilometres of reconstruction, an additional 14 kilometres of bituminous surface treatment and other related work such as seeding and design. Approval of the US Transportation Equity Act for the 21st Century (TEA-21) legislation provided an additional \$94 US million for the 160 kilometres remaining to be reconstructed over the next five years.

## NATIONAL HIGHWAY POLICY

On December 16, 1998, the Council of Ministers Responsible for Transportation and Highway Safety released "The National Highway System: Condition and Investment Needs Update 1997".

The study, undertaken jointly by the federal, provincial and territorial transportation departments, updates work originally undertaken in the early 1990s to determine the costs of improving the condition of, and reducing congestion on, the 25,000-kilometre network of key interprovincial and international road linkages. To maintain comparability with previous work, no changes were made to the routes originally designated in 1988 as part of the National Highway System. Table 12-24 shows the cost estimates to correct national highway deficiencies.

The key findings of the study are:

- Governments have invested over \$8 billion in capital improvements and \$3 billion in the maintenance of the National Highway System since 1988; annual expenditures on the system are currently twice the levels reported in 1988.
- While increased investment has corrected some of the deficiencies in the system, overall, the state of the National Highway System has not improved since 1988. When measured against the minimum design and operational criteria proposed in 1988, the length of the system with deficiencies in the areas of pavement roughness, operating speed/capacity has increased about 30 per cent.
- The estimated cost of correcting all current deficiencies of the National Highway System is \$17.4 billion (1997 dollars). Departing from the procedure used in 1989, this updated estimate includes costs associated with required capacity improvements on existing freeways which have 4 or more lanes.
- While estimated needs have dropped slightly in eastern Canada, cost estimates in central and western Canada are generally 30 to 50 per cent higher than the estimates prepared in 1989.

TABLE 12-6
COST ESTIMATES TO CORRECT NATIONAL HIGHWAY SYSTEM DEFICIENCIES

Cost Estimates in Millions of Dollars (\$1997)									
			New	Twinning	,				
Work Type	Resurfacing	Reconstruction	Construction	New 4 lanes	Interchanges	Structures	Total		
British Columbia Alberta Saskatchewan Manitoba Ontario Quebec New Brunswick Nova Scotia Prince Edward Island Newfoundland Yukon Northwest Territories	\$ 231.8 91.3 105.7 111.6 258.6 152.5 25.9 71.4 5.8 9.5 156.9 47.3	\$ 697.0 114.1 126.2 35.9 25.7 108.8 - - - - - - - - - - - - - - - - - -	\$ 205.9 567.2 91.5 134.8 283.0 20.4 550.0 215.1 25.9 39.7	\$ 805.6 380.7 163.8 105.1 2,874.2 1,480.3 1,213.7 105.4 - 9.0 33.0	\$ 33.0 1,396.0 241.0 161.4 . 102.9 91.0 14.6 7.0	\$ 967.8 480.7 103.0 27.8 204.0 1,022.1 54.6 39.4 23.5 4.2 60.0	\$ 2,941.1 3,030.0 831.2 576.6 3,645.5 2,887.0 1,789.6 537.5 93.4 136.1 370.1 253.5		
Federal	52.2	226.6	-	-	-	-	278.8		
Total	\$1,320.5	\$1,711.6	\$2,133.5	\$7,170.8	\$2,046.9	\$2,987.1	\$17,370.4		

Source: Council of Ministers Responsible for Transportation and Highway Safety

- The impacts and benefits that would be associated with an upgraded National Highway System (NHS) have increased significantly, due in large part to increasing congestion on key linkages in the system. Over a 25 year horizon, the expected present value of benefits of the NHS investment program were estimated to exceed \$30 billion, comprising:
  - \$22.0 billion in travel time savings
  - \$5.8 billion in highway safety improvements
  - \$2.9 billion in reduced vehicle operating costs
  - \$1.3 billion in network benefits.
- The study estimated that the reduced congestion and improved highway standards could be expected to reduce the number of fatal traffic accidents by up to 247 per year and injury accidents by up to 16,000 per year.
- It also calculated that reducing congestion and improving the level of service provided by the

NHS could be expected to reduce fuel consumption by up to 236 million litres per year.

## FEDERAL CONTRIBUTION PROGRAMS

In fiscal year 1998/99, through federal contribution programs, the government contributed \$198.9 (\$197.2 million + \$1.7 million under CAIP6) to provincial and territorial highway improvements, as well as repairs to federally financed structures.

A large portion of the funding for highway improvement projects came from the 1993 - 1999
Strategic Highway/Transportation
Improvement Programs, part of the government Strategic Capital
Investment Initiative. This
\$845 million initiative earmarked funding for cost-shared improvement projects across the country, the rehabilitation of the federally owned Jacques-Cartier and Champlain bridges in
Montreal, the upgrading of the

Trans-Canada Highway through the Banff, Yoho and Terra Nova national parks, and improvements to the Alaska Highway.

In addition, Highway
Improvement Programs
(1987 - 1999) are providing more
than \$300 million to create a more
efficient and effective transportation
system in New Brunswick and Nova
Scotia, while the Newfoundland
Transportation Initiative
(1987–2002) is providing
\$640 million for upgrades to the
Trans-Canada Highway and regional
trunk roads, following the closure of
the Newfoundland Railway.

Also on the east coast, the Atlantic Freight Transition Program was instituted following the elimination of the Atlantic Region Freight Assistance Act and the Maritime Freight Rates Act. This 1995 - 2001 program provides \$326 million to the four Atlantic provinces and Quebec for improvements to their freight transportation systems.

<sup>6</sup> The CAIP program includes expenditures for infrastructure items other than road; the \$1.7 million is the estimated share of CAIP spending that went towards roads.

TABLE 12-7
CURRENT TRANSPORT CANADA HIGHWAY CONTRIBUTION PROGRAMS
1987/88 to 2002/03

	Millions	of Dollars Spent in	************		Forecast		
Program	Total	previous years			2000/2001		
lewfoundland							
Trans-Canada Highway Program	405.00	235.15	34.22	34.00	34.00	34.00	33.63
Regional Trunk Road	235.00	148.96	28.16	20.00	20.00	15.50	2.38
Strategic Highway Improvement Program	10.00		0.00	0.00	0.00	0.00	0.00
Atlantic Freight Transition Program	21.00		5.02	4.00	1.11	0.00	0.00
Sub-total	671.00	404.98	67.40	58.00	55.11	49.50	36.01
rince Edward Island							
Fixed Link Highway Improvement Program	21.45		0.27	0.00	0.00	0.00	0.00
Atlantic Freight Transition Program	21.00		9.83	3.25	0.00	0.00	0.00
Sub-total	42.45	29.10	10.10	3.25	0.00	0.00	0.00
lova Scotia							
Highway Improvement Program	73.50		3.02	1.98	0.00	0.00	0.00
Highway Improvement Program SCII	30.00		0.00	0.00	0.00	0.00	0.00
Strategic Highway Improvement Program	70.00		10.91	3.33	0.00	0.00	0.00
Atlantic Freight Transition Program Sub-total	85.00 <b>258.50</b>		28.22 <b>42.15</b>	8.52 <b>13.83</b>	0.00 <b>0.00</b>	0.00 <b>0.00</b>	0.00 <b>0.00</b>
<del></del>	230.30	202.52	42.13	13.03	0.00	0.00	0.00
lew Brunswick	222.00	400 44	10.00	00.70	E0.00	E4 07	0.00
Highway Improvement Program	338.80 20.00		19.99 0.00	33.70 0.00	50.00 0.00	51.97 0.00	0.00
Highway Improvement Program SCII Strategic Highway Improvement Program	130.00		0.00	0.00	0.00	0.00	0.00
Fixed Link Highway Improvement Program	21.59		0.006	0.00	0.00	0.00	0.00
Atlantic Freight Transition Program	121.00		10.03	0.55	0.00	0.00	0.00
Sub-total	631.39		30.03	34.25	50.00	51.97	0.00
Québec							
Henri-Bourassa	21.00	21.00	0.00	0.00	0.00	0.00	0.00
Strategic Highway Improvement Program	75.00		0.30	0.00	0.00	0.00	0.00
Atlantic Freight Transition Program	78.00		14.12	17.63	0.00	0.00	0.00
Québec Outaouais Roads Agreement	273.00	179.90	6.30	4.70	5.00	5.00	72.10
Sub-total Sub-total	447.00	321.85	20.72	22.33	5.00	5.00	72.10
Ontario							
Strategic Highway Improvement Program	96.54	69.89	26.65	0.00	0.00	0.00	0.00
Manitoba							
Strategic Transportation Improvement Program	35.00	35.00	0.00	0.00	0.00	0.00	0.00
Saskatchewan							
Strategic Highway Improvement Program	35.00	35.00	0.00	0.00	0.00	0.00	0.00
Alberta							
Strategic Highway Improvement Program	30.00	30.00	0.00	0.00	0.00	0.00	0.00
British Columbia	00.00		0.00	0.00	0.00	0.00	0.00
Strategic Highway Improvement Program	30.00	29.81	0.19	0.00	0.00	0.00	0.00
	30.00	25.01	0.19	0.00	0.00	0.00	0.00
/ukon	10.00	40.00	0.00	0.00	0.00	0.00	0.00
Strategic Highway Improvement Program	10.00	10.00	0.00	0.00	0.00	0.00	0.00
I.W.T							
Strategic Transportation Improvement Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OTALS	2,286.88	1,633.29	197.24	131.66	110.11	106.47	108.11
Source: Transport Canada							

Finally, the \$43-million Fixed Link Agreement (1994–1999) is assisting Prince Edward Island and New Brunswick cope with increased traffic on their highways resulting from the new Confederation Bridge.

As part of the \$300 million Western Grain Transportation Adjustment Fund, \$140 million was allocated to help improve agricultural road infrastructure across Western Canada. Under the Canada Agri-Infrastructure Program (CAIP), it was provided to the following provinces according to the miles of grain-dependent branch line per province:

B.C.	\$ 0.5 M
Alberta	\$ 29 M
Saskatchewan	\$ 84.6 M
Manitoba	\$ 25.9 M

## MARINE TRANSPORTATION INFRASTRUCTURE

## **PORTS**

Canada's major ports are vital links in the national transportation system that supplement the railways and roads that serve Canadians travelling on business or for pleasure, and that are essential for transporting the nation's goods for export or import. The infrastructure that supports the ports portion of this system includes marine terminals that contain a variety of facilities and organizations related to the loading and unloading of vessels berthed at the wharf. Port authorities operate some of these marine terminals, but often they are owned and operated by independent companies that rent space from the port.

## TABLE 12-8 PORTS NO LONGER UNDER THE ADMINISTRATION OF TRANSPORT CANADA, 1996 – 1998

Year	Transferred	De-proclaimed	Demolished <sup>†</sup>	Total
1996	78	199	0	277
1997	32	0	2	34
1998	11	0	0	11
1 Numbers include rem	note ports.			
Source: Transport Ca	nada			

## The Port System

At the end of 1998, Canada's ports system was made up of a variety of facilities that fell under different jurisdictions, including Ports Canada, Harbour Commissions, Transport Canada, the Department of Fisheries and Oceans, and municipal governments and private interests.

Under the National Marine
Policy announced in December
1995, Canada's ports system and
the operation of the St. Lawrence
Seaway are being commercialized.
The federal government is moving
out of direct operation of ports,
giving local users more say in the
port services they pay for and
receive. The National Marine
Policy is implemented under the
Canada Marine Act, which
received royal assent on
June 11, 1998. The policy calls
for three categories of ports:

- · Canada Port Authorities,
- · regional and local ports, and
- · remote ports.

Transport Canada began commercializing ports under its control in 1996, prior to the introduction of the Act, because legislative authority was not required for this process to begin. The coming into force of the Act was delayed beyond the prescribed date of January 1, 1999. On March 1, 1999, Part I of the Act came into force for the ports of

Halifax, Montreal and Vancouver, creating the first three Canada Port Authorities.

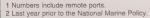
When Part I is applied to the remaining ports in Schedule 1 of the Act, there will be 18 Canada Port Authorities. The authorities are considered self-sufficient ports that are critical to domestic and international trade. They will include Ports Canada local port corporations, major Canada Ports Corporation divisional ports, and most harbour commissions.

On March 1, 1999, Part II of the *Canada Marine Act* also came into force for existing public ports. This event consolidated the second category of ports, the regional and local ports, with other public ports. When all sections of the Act are in force, this category will include Transport Canada facilities not considered to be remote facilities, as well as any Canada Ports Corporation facilities or harbour commissions not incorporated as Canada Port Authorities.

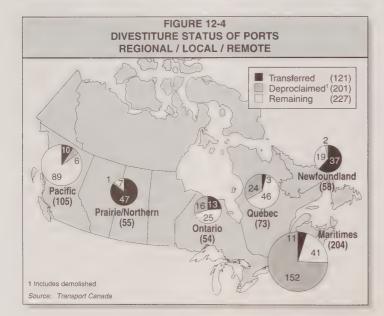
Regional and local ports are being transferred to other federal departments or to provincial governments, municipal authorities, community organizations or private interests. The transfer of ports began in 1996 under the National Marine Policy with the devolution of 277 sites, and continued in 1997 with the devolution of 34 sites. In 1998, Transport Canada divested a

TABLE 12-9 STATUS OF TRANSPORT CANADA'S PORTS BY PROVINCE AND YEAR, 1996 – 1998									
(Transport Canada Administered Public Port Sites¹)									
Year	1995²	1996	1997	1998					
Newfoundland	57	39	19	18					
New Brunswick	45	9	7	6					
Nova Scotia	35	31							
Prince Edward Island	31	4	4	4					
Quebec	73	48	46	46					
Ontario	56	39	32	27					
Manitoba	2	2	2	2					
Saskatchewan	4	4	4	4					
Alberta	3	1	1	1					
British Columbia	105	91	88	88					
Northwest Territories	45	0	0	0					
Total	549	272	238	227					

TADLE 40.0



Source: Transport Canada



further 11 facilities including one to the Province of New Brunswick, one to the Province of Ontario, two to municipal authorities, five to other local private interests, and two to other federal departments. By the end of 1998, a total of 322 public ports had been transferred, deproclaimed or demolished.

Table 12-8 summarizes the changes that have taken place in responsibility for ports operations since 1996.

A total of 227 remain under federal control. Table 12-9 summarizes the regional distribution of the ports administered by Transport Canada from 1995 to 1998. The federal government will continue to maintain remote ports that serve the basic transportation needs of isolated communities unless local interests express a willingness to assume ownership of such port facilities. While 14 remote ports were divested in 1996 and a further 12 in 1997, there were no divestitures in 1998. Transport Canada continued to administer 34 remote ports in Ouebec, Ontario, Manitoba and British Columbia. A growing number of "other" ports are to be operated by provincial or municipal governments and private interests as Transport Canada divests itself of its facilities.

Figure 12-4 shows the Divestiture Status of Regional, Local and Remote Ports showing which have been transferred or deproclaimed as well as the number of ports remaining.

At the end of 1998, the Department of Fisheries and Oceans administered approximately 1,682 harbours used for commercial and recreational boating under the *Fishing and Recreational Harbours Act*. At the end of 1998, there were an additional 85 of these "other" ports, including 35 private, 34 provincial and 18 municipal ports.

### **Financial Performance**

## Ports Canada

In 1997, Ports Canada posted total revenues of \$245 million, with a net income of \$35 million and operating cash flows of \$92 million. The seven major ports handled 83 per cent of the volume and generated roughly 76 per cent of the total revenues of Ports Canada ports. Audited financial statements for 1998 were not available.

Table 12-10 illustrates 1997 revenues, expenses and some key

TABLE 12-10
FINANCIAL PROFILE, PORTS CANADA PORTS, 1997
(\$ 000)

(Millions of dollars)									Total
Item	Vancouver		Halifax	Quebec	Saint John	St. John's	Prince Rupert	Divisional Ports*	All Ports
Operating revenues Operating expenses Operating income	71.5 56.5 <b>15.0</b>	56.6 49.8 <b>6.8</b>	15.0 12.0 <b>3.0</b>	13.3 13.6 <b>0.3</b>	12.1 11.0 <b>1.1</b>	3.2 2.8 <b>0.4</b>	13.2 11.0 <b>2.2</b>	59.6 32.0 <b>27.6</b>	244.5 185.4 <b>59.1</b>
Ratio: Expenses/Revenues	0.79	0.88	0.80	0.77	0.91	0.89	0.83	0.54	0.76
Net income Net fixed assets	5.1 430	12.4 157.9	3.1 63.2	0.3 49.8	1.5 57.0	0.6 11.4	2.7 92.4	8.8 109.8	34.5 971.6
Ratio: Net income/Net fixed assets	0.01	0.08	0.05	0.01	0.03	0.05	0.03	0.08	0.04
Funds from operations Investment income Total assets Net capital expenditures Retained earnings Contributed capital	23.5 3.0 533.1 23.8 215.8 150.3	24.4 5.6 260.8 9.9 86.6 153.9	5.6 0.3 76.3 8.1 20.1 50.9	3.5 0.5 62.9 2.2 1.2 58.2	4.6 0.4 71.3 0.7 3.7 61.7	1.2 0.2 18.1 0.3 7.2 10.1	4.0 0.5 105.3 0.2 18.8 84.6	25.4 3.7 287.9 11.2 (136.4) 64.9	92.3 14.2 1415.7 56.4 216.9 634.5

\* Ridley Terminals is included in Divisional Ports, yet is operated independently of Divisional Ports.

Source: Annual Reports

ratios for Ports Canada ports and for divisional ports as a whole.

The overall operating ratio for Ports Canada ports was 76 per cent in 1997. Taken together, the major ports had a ratio of 83 per cent, with individual ratios ranging from 77 to 91 per cent. Except for Quebec and Vancouver, ratios for all major ports were above 80 per cent. For divisional ports, the operating ratio as a whole was 54 per cent.

The return on assets for Ports Canada ports was four per cent in 1997. Montreal had the highest return on assets with eight per cent, with its investment income almost as large as its operating income. Taken together, the major ports' return was three per cent, compared with eight per cent for divisional ports.

From 1994 to 1997, the financial profile of most ports consistently improved. Revenues rose from \$232 million to \$245 million, an

increase of six per cent. All this growth occurred at major ports.

Operating costs at major ports remained relatively stable, increasing only one per cent during this period. At the divisional ports, operating revenues and operating expenses have both decreased slightly. With expenses decreasing slightly more than revenues, the operating income increased by two per cent. Overall, operating income for all ports improved from \$47.9 million to \$59.1 million, an increase of 23 per cent.

Total 1997 net income of all ports, major and divisional, has more than tripled, moving from \$9.2 million in 1994 to \$34.5 million in 1997. These financial changes occurred as traffic volumes grew more than five per cent between 1994 and 1997. During this period, revenue per tonne remained relatively stable at \$1.31. Expenses per tonne however, dropped from \$1.04 in

1994 to \$0.99 in 1997, a decrease of almost five per cent.

Table 12-11 shows revenues, expenses and incomes for all Ports Canada ports from 1994 to 1997.

## **Harbour Commissions**

With the exceptions of Toronto and Oshawa, all harbour commissions reported positive net incomes in 1997. The Hamilton and Fraser harbour commissions posted the largest net incomes at \$1.7 and \$1.2 million, respectively. Total revenues were \$52.3 million and expenses \$50.2 million, creating an operating ratio of 96 per cent. Net income of \$10 million provided a return on total assets of 2.9 per cent.

A review of the financial data of harbour commissions' between 1993 and 1997' shows both revenues and expenses declining during this period. Expenses declined by 0.8 per cent, revenues by 4.4 per cent. Consequently,

As of 1995 all harbour commissions operate on a calendar year basis (January to December). Prior to that, the Toronto Harbour Commission operated on a fiscal year basis (April to March).

TABLE 12-11 FINANCIAL RESULTS OF MAJOR AND DIVISIONAL PORTS 1994 – 1997

(Millions of dollars)

			Оре	Net	Net Income/ Net Fixed				
		Revenues	Expenses	Income	Ratio	Income	Assets		
Major Ports	1994	170.7	149.8	20.9	0.88	3.8	0.00		
	1995	169.8	148.3	21.4	0.87	24.3	0.03		
	1996	175.9	143.4	32.9	0.81	18.3	0.02		
	1997	184.9	153.4	31.5	0.83	25.7	0.03		
Divisional Ports	1994	60.8	33.8	27.0	0.56	5.3	0.05		
	1995	60.1	33.9	26.2	0.56	11.3	0.11		
	1996	59.0	33.3	25.8	0.56	13.2	0.12		
	1997	59.6	32.0	27.6	0.54	8.8	0.08		
Total - All Ports	1994	231.5	183.7	47.9	0.79	9.2	0.01		
	1995	229.9	182.3	47.6	0.79	35.6	0.04		
	1996	235.0	176.6	58.7	0.75	31.5	0.03		
	1997	244.5	185.4	59.1	0.76	34.5	0.04		

Note: With the exception of ratios, the measurement unit is millions of dollars.

Net fixed assets does not include value of projects under construction included in audited statements.

Source: Annual Reports

TABLE 12-12
HARBOUR COMMISSIONS FINANCIAL RESULTS
1997

					-					
ltem	Port Alberni	Fraser	( <b>1</b> Hamilton	Millions of <i>Nanaimo</i>	dollars) North Fraser	Oshawa	Thunder Bay	Toronto	Windsor	Sum Harbour Commission
Operating revenues	4.0	9.4	11.1	7.1	4.4	0.6	3.2	10.9	1.6	52.3
Operating expenses	3.7	8.2	9.4	7.8	3.8	0.8	3.2	12.3	1.0	50.2
Operating income	0.3	1.2	1.7	-0.6	0.5	-0.2	0	-1.4	0.6	2.1
Ratio:										
Expenses/Revenues	92.5%	87.2%	84.7%	109.9%	86.4%	133.3%	100.0%	112.8%	62.5%	96.0%
Net income	0.6	5.0	2.4	0.1	0.7	-0.2	1.2	-0.4	0.6	10.0
Total assets	15.9	102.3	74.6	34.1	11.2	6.8	26.7	67.6	8.1	347.3
Ratio:										
Net income/Total assets	3.8%	4.9%	3.2%	0.3%	6.3%	-2.9%	4.5%	-0.6%	7.4%	2.9%
Source: Transport Canada										

operating income has been almost halved to \$2.1 million, although the operating ratio has improved to 96 per cent. Traffic volume was 45.4 million tonnes in 1997.

Tonnage handled at harbour commission ports rose by 18 per cent over the five-year period (with year-to-year fluctuations). Comparing 1997 with 1993, revenues and expenses expressed on a per-tonne basis were

about 19 per cent and 16 per cent lower respectively. Net income declined over the same period.

Table 12-12 details financial results for all harbour commissions for 1997.

## Transport Canada Ports

Of the ports remaining under Transport Canada's control, approximately ten per cent generated three-quarters of the total revenues for 1997/98.

For this fiscal year, the gross revenues of these facilities were \$20.7 million, while expenses were \$27.4 million. This left an operating revenue shortfall of \$6.7 million, with an operating ratio of 132 per cent. Capital expenditures for the year were \$1.9 million. An additional

\$1.5 million came from grants and contributions related to transfers associated with ports divestitures,

Revenues increased by 58 per cent during this time, mostly in the last three years. Traffic growth and fee increases since 1994/95 contributed to the rise in revenues. Expenses fluctuated over this period.

Between 1993 and 1997, revenues per tonne have increased from \$0.15 to \$0.25, or by 67 per cent, while expenses per tonne<sup>8</sup> have remained relatively stable at \$0.33 per tonne.

Table 12-13 summarizes the financial details of ports and harbours remaining under Transport Canada's control from 1993/94 to 1997/98.

## Port Traffic

The following preliminary traffic data for 1998 shows that:

- The Port of Vancouver handled 72 million tonnes and 873,102 passengers.
- The Port of Prince Rupert handled 12.5 million tonnes.
- The Port of Montreal reported total traffic of 21 million tonnes
- Halifax Port Corporation handled 13.2 million tonnes.
- The Port of Saint John handled more than 19 million tonnes.

## Port Traffic Statistics

Based on Statistics Canada data (available only up to 1997), Canada's ports handled a total of 376.4 million tonnes of cargo in 1997, a slight increase from the 357.7 million tonnes handled in 1996

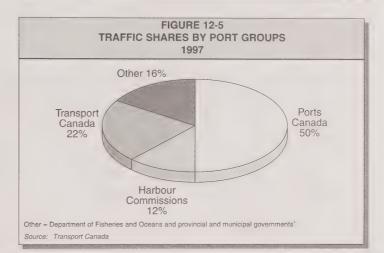
Figure 12-5 shows traffic shares by port groups in 1997.

## TABLE 12-13 FINANCIAL RESULTS FOR TRANSPORT CANADA PORTS 1993/94 – 1997/98

(\$ Millions)											
	1993/94	1994/95	1995/96	1996/97	1997/98						
Revenue <sup>1</sup>	13.1	12.9	17.1	20.3	20.7						
Expenses <sup>2</sup>	28.5	28.7	33.6	28.5	27.4						
Operating income	-15.4	-15.8	-16.5	-8.2	-6.7						
Capital expenditures	23.8	23.1	11.3	11.9	1.9						
Grants & contributions <sup>3</sup>			10.0	13.1	1.5						
Ratio: Expenses/Revenue	s 218%	222%	196%	140%	132%						

- 1 This represents gross revenues
- 2 This represents operating and maintenance expenses including commissions
- 3 This item represents transfers related to the devolution of port facilities

Source: Annual Reports, and Transport Canada



Ports Canada ports handled the largest share at 50 per cent, with 12 per cent transported through harbour commissions' ports.

Another 22 per cent of the cargo was moved through Transport Canada facilities. The remaining 16 per cent was handled by other facilities, including those managed privately and those managed by or on behalf of the Department of Fisheries and Oceans and provincial and municipal governments.

Ports Canada ports and harbour commissions saw traffic increase by 4 per cent from 1996 to 1997, while Transport Canada ports saw an increase of 15 per cent. "Other" ports saw a decrease of one per cent. Overall, total tonnage increased by five per cent.

At those declared public ports where Transport Canada has no facilities and cargo is transported across private wharves, cargo shipped totalled 29.5 million tonnes, or 36 per cent of the total traffic handled by Transport Canada's ports. In total, 61.5 million tonnes crossed "other" ports. In the "other" category, Port Cartier, with 20.9 million tonnes, handled the most cargo.

<sup>8</sup> Tonnage statistics include cargos moved across private facilities within Transport Canada public harbours.

TABLE 12-14
TOTAL TONNAGE HANDLED IN CANADA'S PORT SYSTEM

	1000 10	0,					
(in thousands of tonnes)							
Port System	1996 Total	1997 Total	% Change				
Ports Canada*	180,207	187,279	4				
Harbour Commissions	43,487	45,355	4				
Transport Canada*	71,820	82,237	15				
Other	62,234	61,536	-1				
Total	357,748	376,407	5				

<sup>\*</sup> Tonnage statistics include cargos shipped across private facilities

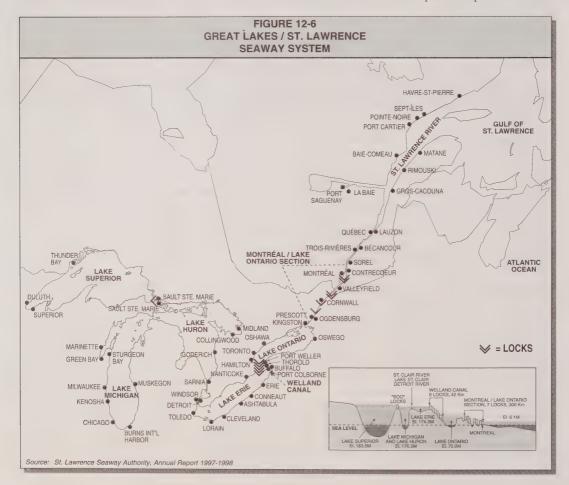
Source: Statistics Canada, Cat. 54-205 XPB

Table 12-14 provides details of tonnage handled at Canada's ports, harbour commissions, and selected Transport Canada and "other" facilities.

## St. Lawrence Seaway

## **Background**

The St. Lawrence Seaway waterway connecting the Port of Montreal and Lake Erie is a joint responsibility of Canada and the United States. Canada is responsible for the eight locks of the Welland Canal and five of the seven locks between Montreal and Lake Ontario, while the American Saint Lawrence Seaway Development Corporation



100.0

25.7

(SLSDC) operates the remaining two locks.

The Seaway can accommodate vessels 225.5 metres in length, 23.8 metres in beam and 8 metres in draft subject to water levels. As a ship travels west through the Seaway from the Port of Montreal, the locks eventually raise the ship to the height of a 60-storey building above the water level at Montreal. The Seaway is closed to traffic during the winter months, usually from the end of December through to the end of March. Figure 12-6 shows the St. Lawrence Seaway system.

1997

## **Seaway Commercialization**

The year 1998 saw major changes in the management of the Seaway as the St. Lawrence Seaway Authority (SLSA), which had been responsible for the Seaway since its opening in 1959, ceased to exist. On October 1, 1998, following more than three years of complex negotiations, management of the operations and maintenance of the navigational aspects of the Seaway passed to a not-for-profit private sector corporation, the St. Lawrence Seaway Management Corporation (SLSMC), controlled by Seaway users. Major bridges not related to navigation, including the Montreal bridges and the two international bridges, formerly the responsibility of the SLSA, were handed to a new Crown corporation, the Federal Bridge Corporation Ltd. The SLSA and the SLSA Act were dissolved on December 1, 1998.

Transfer of Seaway operations to a not-for-profit corporation proceeded under Part III of the Canada Marine Act. This Act provided the Minister of Transport

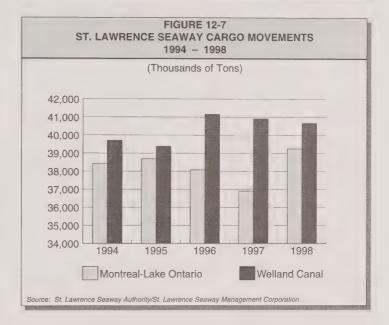
**TABLE 12-15** ST. LAWRENCE SEAWAY COMMODITY SHARES 1993 - 1997 (Percentage) Iron Iron & Coal & Year Grain Ore Steel Coke Other Total 1993 25.8 26.6 10.8 10.8 26.0 100.0 1994 25.5 25.8 14.4 9.3 25.1 100.0 1995 30.1 24.7 10.1 10.4 24.8 100.0 1996 24.3 26.8 12.1 109 25.8 100.0

11.1

11.3

24.6 Source: St. Lawrence Seaway Authority/St. Lawrence Seaway Management Corporation

27.2



with the authority to complete the transaction with the SLSMC.

Many of the required initiatives to meet the objectives of the new corporation were actually put in place before it officially took over the Seaway on October 1, 1998. This was made possible by a Users' Group transition team that worked with government to develop the complete management agreement, while also working with the SLSA to develop

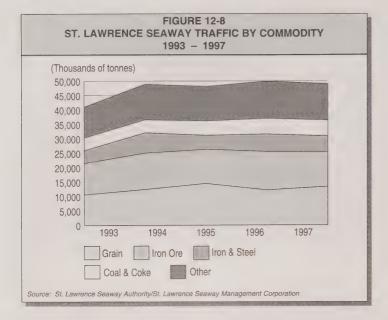
implementation strategies for cost reductions.

## Traffic in 1997 and 1998°

The total value of cargo - both Canadian and US - transiting the Seaway was estimated by the SLSA at \$6.7 billion for the 1997 season.

The main commodities moved in the Seaway are grain, iron ore, steel products and coal. In the "other" group are important movements of

It is important to note that the statistics reported herein for traffic relate to a different time period than that for the financial results. The latest traffic results reported are for the calendar year 1998. However, with respect to financial results, the latest available data relate to the 1997/98 fiscal period, which ended March 31, 1998. Since the Seaway is closed to traffic for the winter (usually from late December to the end of March), the traffic that relates to the 1997/98 fiscal year would be that recorded for the 1997 calendar year.



petroleum products, salt, potash, and low-value bulk construction materials such as limestone, cement and gypsum. While tonnage does fluctuate somewhat, in 1997 the above four commodities accounted for 36.4 million tonnes, or 74.3 per cent of total cargo. Table 12-15 shows the shares of each commodity group from 1993 to 1997.

Traffic passes through the two sections of the Seaway, the Montreal/Lake Ontario (MLO) section, and the Welland Canal. It moves either through one or both sections on the way to the final port. Using total tonnage as a proxy for transits in 1998, the MLO section increased by about six per cent to 39.2 million tonnes, while total traffic on the Welland Canal declined by less than one per cent to 40.7 million tonnes. Figure 12-7 summarizes cargo movements through each section of the St. Lawrence Seaway from 1994 to 1998.

After a period of decline, traffic turned around in 1994. It rose

20 and 25 per cent on the MLO and Welland sections respectively between 1993 and 1994. Tonnage has remained fairly stable in the last five years, increasing 1.1 per cent on the MLO, and 1.7 per cent on the Welland, since 1994. (While the references here are to tonnage on each section of the Seaway, it is important to note that because the tonnage can move through both sections, it is not cumulative.)

In 1998, Canadian grain shipments on the MLO section decreased by 24 per cent to 6.7 million tonnes; shipments on the Welland Canal also decreased 24 per cent to 6.8 million tonnes.

US grain shipments, meanwhile increased by 34 per cent to 6.1 million tonnes on the MLO section, and by 32 per cent on the Welland Canal to 6.2 million tonnes.

Iron ore shipments on the MLO were up 9.7 per cent to 11.1 million tonnes; shipments on the Welland Canal decreased by

17.4 per cent to 6.5 million tonnes. This reflects a greater reliance by Canadian steel mills on iron ore originating from Quebec–Labrador in 1998.

In 1998, shipments of general cargo, including steel, increased dramatically on both sections of the system. On the MLO, shipments increased 37.2 per cent to reach 7.0 million tonnes; on the Welland Canal, shipments were up 34.4 per cent to 5.5 million tonnes.

The tonnage of all commodities rose from 1993 to 1997 by 19.4 per cent in total. However, this followed a period of declining traffic on the Seaway. Also, total tonnage has changed very little since 1994. The principal commodities of grain (+seven per cent) and coal (+22.5 per cent) have increased, while iron ore (-4.5 per cent) and iron and steel (-22.8 per cent) have declined.

Figure 12-8 shows SLSA traffic by commodity from 1993 to 1997.

### Rates and Tariffs

On June 1, 1998, the Canadian government implemented a two per cent toll increase for the Canadian section of the Seaway, as per the terms of the agreement negotiated with Seaway users.

Tolls were last increased in 1993.

Discussions with the US took place before toll increases were applied. While the US administration as well as other US interests raised objections, Canada asserted that the increase was minimal, that it would have a negligible effect on traffic, and that it was consistent with the terms of the 1959 Treaty on Tolls and with the past practice of the parties under that Treaty.

### **Financial Profile**

Operating expenses in 1997/98 reached \$85.5 million, an increase of 6.8 per cent over 1996/97. While toll revenues decreased by \$1.3 million, operating revenues increased by \$1.2 million to \$84.6 million due to an offsetting increase in revenues from leases and licenses.

Operating income in 1997/98, before unusual items, and excluding investment income, was - \$1.0 million, compared with \$3.3 million in 1996/97. Unusual charges of \$6.5 million were incurred to cover the Departure Incentive Program (staff levels are expected to be reduced by 119 employees, or 17 per cent, between March 1997 and March 1999) and the costs of commercialization. After these extraordinary items, and adjusting for investment income and taxes, a net loss of \$3.7 million resulted for the year.

The SLSA was able to fund 1997/98 capital expenditures of \$10.2 million from its internal funds. SLSA reserve funds were drawn down by \$700,000 to \$45.9 million at the end of the fiscal period.

A review of financial results for the last five fiscal years indicates that revenues have risen 21.6 per cent, faster than expenses, at 9.6 per cent. Traffic in total increased by 19 per cent between 1993 and 1994, rebounding to previous levels, and revenues are relatively stable when comparing 1997 with 1994. Nevertheless, net losses have been reduced over the period by more than one half, and net income has been positive in three of the five years. Table 12-16 shows the St. Lawrence Seaway's financial performance for the fiscal years 1993/94 to 1997/98.

TABLE 12-16
ST. LAWRENCE SEAWAY'S FINANCIAL PERFORMANCE
1993/94 - 1997/98

(\$ millions)							
	Operating Revenues	Operating Expenditures	Operating Income	Net Income			
1993/94	69.6	78.0	-8.4	-6.1			
1994/95	83.9	74.1	9.9	15.5			
1995/96	78.1	80.6	-2.4	1.9			
1996/97	83.4	80.1	3.3	0.2			
1997/98	84.6	85.5	-1.0	-3.7			
Source: St. Lawrence Seaway Authority, Annual Report							

## MARINE PILOTAGE

## Legislative Framework

Marine pilotage in Canada is governed by the *Pilotage Act* of 1972, which established four regional pilotage authorities: Atlantic (APA), Laurentian (LPA), Great Lakes (GLPA) and Pacific (PA). All authorities report directly to the Minister, although they are not considered agents of the Crown. Each authority is responsible for providing safe and efficient pilotage services that respond to their clients' particular requirements.

As part of the Marine Policy announced in December of 1995, the federal government is putting many of its activities on a more commercial footing, including marine pilotage. The more efficient pilotage operation is now expected to be completely self-sufficient and self-financing.

Figure 12-9 shows the respective territories covered by each of the four pilotage authorities.

## Canada Marine Act

Changes to the *Pilotage Act* (part of the *Canada Marine Act*) were proclaimed in October 1998. These changes will put further downward pressure on pilotage costs and require greater financial

accountability from the authorities. Key amendments relating to pilotage include denying the authorities access to parliamentary appropriations and setting limits on the amounts the authorities can borrow elsewhere.

In accordance with the legislation, the Minister of Transport has tasked the Canadian Transportation Agency (CTA) with undertaking a review of specific outstanding pilotage issues and reporting back to him by September 1, 1999. The CTA review will form the basis of a report to Parliament that the Minister must table no later than 30 House-sitting days after October 1, 1999.

## Financial and Operating Performance

In 1998, pilotage revenues, on a nationwide basis, once again exceeded expenditures, with three authorities enjoying modest surpluses. Although the Laurentian Pilotage Authority incurred a loss of \$273,000, it reduced its deficit by 67 per cent from the previous year (see Table 12-17). Current policy prohibits parliamentary appropriations, so the authority financed its loss with a commercial loan from a financial institution.

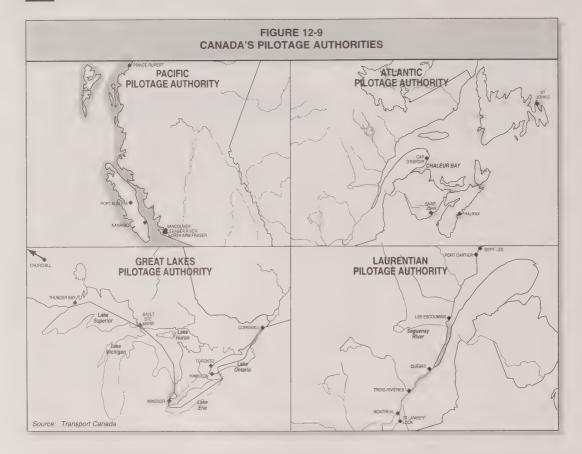


Table 12-17 shows the financial results for the four pilotage authorities in 1998.

The results for 1998 represent an improvement over 1997 and a continuation of the trend toward positive net incomes over the last few years.

Table 12-18 shows the financial results for each pilotage authority from 1994 to 1998.

Total revenues have risen by 20 per cent while expenses, except for the Great Lakes Authority, have increased more slowly by 14 per cent. GLPA expenses have risen 47 per cent over the 5 year period. Nevertheless, Figure 12-18 shows the trend toward improvement of the bottom line,

as total net income of pilotage authorities has more than doubled.

Figure 12-10 shows the upward trend in the total net income of pilotage authorities.

Table 12-19 shows the number of assignments for each Pilotage Authority and the total for all authorities between 1994 and 1998. The variation among the authorities is influenced by the nature of their territories and fluctuations over the period is likely a response to changing traffic levels. However, overall the total assignments after an initial decline in the first year have grown by 8.4 per cent since 1995.

## CANADIAN COAST GUARD

### Responsibilities

Over the past three years, the Canadian Coast Guard has undergone a major reorganization, designed both to refocus its role within a newly merged Department of Fisheries and Oceans and to ensure service delivery that is responsive to client needs and consistent with the department's oceans mandate. The Coast Guard's mandate now focuses more on sustainable ocean management that permits a safe, environmentally sustainable marine transportation system. It advances the oceans mandate both through its internal partnership with DFO sector counterparts and through its

primary role of ensuring safe and environmentally responsible use of Canada's waterways. The Coast Guard organization splits into five business lines delivered across the five DFO Regions: marine navigation services; marine communications and traffic services; icebreaking operations; rescue, safety and environmental response activities; and fleet management.

The Coast Guard delivers a broad range of marine programs, policies and services and, in doing so, deals with several sectors within the marine community. It delivers services to a cross-section of clients, including commercial shipping interests, recreational boaters, the fishing industry, ferry services, tug and barge re-supply operations in the North, cruise lines, private sector shippers, and provincial, municipal and territorial governments as well as federal government departments. The Coast Guard also serves the general public through its role in protecting their interest in preserving ecosystems, ensuring that water supplies remain unpolluted by oil and chemical spills, and protecting recreational resources.

## **Marine Navigation Services**

The Marine Navigation Services (MNS) group provides, operates and maintains a system of aids to navigation to help mariners in determining their position in relation to land and hidden dangers. Its objective is to reduce navigation risk and transit time in support of an environmentally sound transportation system. The group also provides water-level monitoring services and protection of navigation rights.

The group's navigational infrastructure consists of 262 automated light stations,

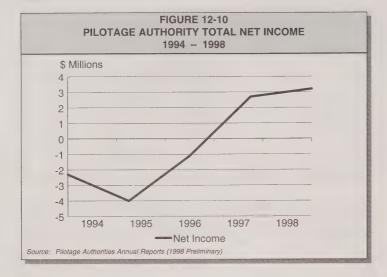
PILOTAG	TABLE 12-17 PILOTAGE AUTHORITY FINANCIAL RESULTS 1998						
(\$ 000's)							
			Net Income				
	Revenues	Expenditures	(Loss)				
Atlantic	9,425	8,755	670				
Laurentian	41,407	40,943	464				
Great Lakes	17,250	15,549	1,701				
Pacific	34,441	37,056	385				
Totals	105,523	102,303	3,220				
Source: Pilotage Annual Reports	s (preliminary)						

TABLE 12-18 PILOTAGE AUTHORITY FINANCIAL RESULTS 1994 - 1998								
(\$ millions)								
Region	Year	Revenues	Expenditures	Net Income (Loss)				
Atlantic	1994	6.9	7.6	-0.7				
	1995	7.6	7.6	0.1				
	1996	8.0	7.5	0.5				
	1997	9.6	8.6	1.0				
	<b>1998</b>	<b>9.4</b>	<b>8.8</b>	<b>0.7</b>				
Laurentian	1994	33.4	36.5	-3.2				
	1995	34.4	38.5	-4.2				
	1996	36.0	38.8	-2.8				
	1997	38.2	39.1	-0.8				
	<b>1998</b>	<b>41.4</b>	<b>40.9</b>	<b>0.5</b>				
Great Lakes	1994	13.9	10.6	3.3				
	1995	11.2	10.0	1.2				
	1996	12.7	11.6	1.0				
	1997	13.3	12.0	1.2				
	<b>1998</b>	<b>17.3</b>	<b>15.6</b>	<b>1.7</b>				
Pacific	1994	33.7	35.3	-1.6				
	1995	34.2	35.4	-1.1				
	1996	36.0	35.9	0.2				
	1997	39.8	38.5	1.3				
	<b>1998</b>	37.4	<b>37.0</b>	<b>0.4</b>				
Total Pilotage	1994	87.8	90.1	-2.3				
	1995	87.5	91.5	-4.0				
	1996	92.7	93.9	-1.1				
	1997	101.0	98.3	2.7				
	<b>1998</b>	<b>105.5</b>	102.3	<b>3.2</b>				
Source: Pilotage Authorities Annual Reports (1998 Preliminary)								

52 of which are staffed; five LORAN C communication stations; 18 DGPS transmitter sites; over 6,000 land-based fixed marine aids; and more than 13,000 floating aids.

## Marine Communication & Traffic Services

Marine Communication & Traffic Services provides communications and traffic services for the marine community and for the benefit of the general public to ensure: safety



TOTAL PILOTAGE ASSIGNMENTS AND ASSIGNMENTS PER PILOT 1994 – 1998						PILOT
Pilotage Authority	Indicators	1994	1995	1996	1997	1998
Atlantic	Total Assignments Assignments per Pilot	8,655	8,668	8,576	9,760	9,725
(APA)		188	180	186	212	203
Laurentian	Total Assignments	22,550	21,937	21,342	20,941	22,018
(LPA)	Assignments per Pilot	125	127	123	120	121
Great Lakes	Total Assignments	7,787	6,091	6,901	7,192	9,085
(GLPA)	Assignments per Pilot	148	107	121	113	142
Pacific	Total Assignments	14,053	13,199	13,403	14,212	13,267
(PPA)	Assignments per Pilot	128	115	113	124	121
Total All	Total Assignments	53,045	49,895	50,222	52,105	54,095

TABLE 40 40

## **TABLE 12-20 COAST GUARD** 1998 VESSEL, AIRCRAFT AND FACILITY ASSETS

LPA assignments per pilot for 1994-97 may differ from the 1997 Annual Report on Transportation

because of a change by the authority in the methods for counting pilots

Vessels and Aircraft

132 major ships small craft in excess of 5001

Source: Pilotage Authorities, Annual Reports

- 28 inshore rescue boats 4 air cushion vehicles
- 29 rotary wing aircraft
- 3 fixed wing aircraft<sup>2</sup>

CCG Facilities

24 bases and sub-bases

11 helicopter hangars

2 hover craft facilities

1 Includes lifeboats, surf boats, self-propelled barges, small craft carried on larger ships, shore-based work boats, floating spill boats, oil slick-lickers, and other small craft at CCG bases and light stations.

Two owned by Transport Canada and one Chartered.

Source: Department of Fisheries and Oceans

of life at sea in response to international agreements; protection of the environment through traffic management; efficient movement of shipping; and information for business and national interests.

The group's supporting infrastructure includes staffed communications centres and remote transmitter and receiver sites. The federal government's Program Review, which is nearing completion, has reduced operational centres from 44 to 22.

## **Icebreaking Operations**

Icebreaking permits the safe and efficient movement of marine traffic through the ice-covered Arctic and southern waters, which include the Great Lakes and East Coast of Canada. It also reduces the risk of flooding in areas prone to or threatened by it as a result of ice build-up. This ensures that northern settlements and military sites are re-supplied annually.

The Icebreaking Program is in a period of transition. It is evolving from its historical role of providing a wide range of services at no direct cost to the user, toward a more client-focused. demand-driven operation where commercial users pay a percentage of the service's allocated costs. This evolution is necessary in view of the government's recent downsizing activities, which also recognize that there must be a balance between the needs of commercial and other user groups, and the public interest, such as flood control and support to northern or remote sites.

## Rescue, Safety and **Environmental Response**

The objective of the Rescue, Safety and Environmental Response (RSER) group is to save lives and protect the marine

environment. This group provides maritime search and rescue and emergency preparedness capabilities; promotes boating safety to the marine public; and responds to pollution incidents from shipping through oversight of private-sector clean-up or direct spill response management, depending on the incident's severity.

This group has done substantial work to promote boating safety/loss of life prevention. In January, 1999, the Minister of Fisheries and Oceans unveiled improved regulations for safe boating in Canada. The new framework establishes, among other things, minimum age limits for the use of pleasure boats for recreational purposes and a requirement that those operating such boats be able to demonstrate proof of operator competency.

The group's supporting infrastructure includes 22 search and rescue stations with in-shore rescue boats, 31 regular search and rescue stations, and 63 spill-response equipment depots.

## Fleet Management

The Coast Guard is responsible for managing a large, integrated, multi-tasked fleet that provides efficient sea and air support to several DFO programs. These programs include fisheries management, hydrography, and fisheries and oceans science, as well as the four business lines mentioned above.

This work includes acquiring, scheduling and maintaining the department's vessel and air fleet, and augmenting fleet capabilities when necessary with additional sea and air support from other government departments and the private sector.

## TABLE 12-21 CANADIAN COAST GUARD REVENUES AND EXPENDITURES, 1995/96 to 1998/99

(\$ millions)					
1995/96 1996/97 1997/98 199					
Revenue (1)	11.5	27.3	37.3	52.4	
Gross Expenditures (2)	533.4	540.2	522.8	523.5	
Net Expenditures (1)-(2)	521.9	512.9	485.5	471.1	

Source: Source: Department of Fisheries(Canadian Coast Guard), Includes MNS - Marine Navigation Services, MCTS - Marine Communication & Traffic Services, ICE - Ice breaking Services, RSER - Rescue, Safety and Environmental Response, and Fleet Management

## TABLE 12-22 CANADIAN COAST GUARD REVENUES AND BUDGETED EXPENDITURES, 1998/99

(\$ millions)						
Business Line	MNS	MCTS	ICE	RSER	Fleet Mgmt.	CCG Total
Revenues (1)	28.2	0.5	23.6	0.1	0.0	52.4
Gross Expenditures (2)	130.3	72.4	64.1	111.0	145.7	523.5
Net Expenditures ((1)-(2))	102.1	71.9	40.5	110.9	145.7	471.1

Source: Department of Fisheries(Canadian Coast Guard), MNS - Marine Navigation Services, MCTS - Marine Communication & Traffic Services, ICE - Ice breaking Services, RSER - Rescue, Safety and Environmental Response

Table 12-20 lists the Coast Guard's 1998 assets in terms of vessels, aircraft and facilities.

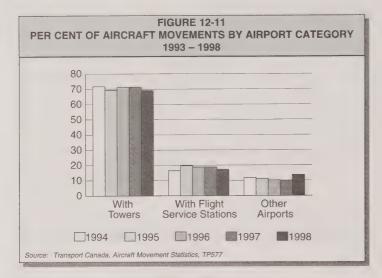
## **Financial Performance**

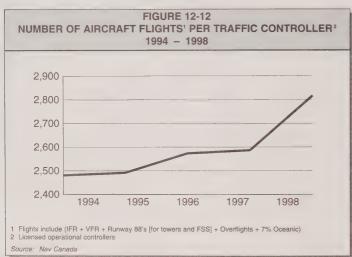
Through a combination of efficiency measures and reduced operations, resulting in lower expenses, the Coast Guard has permanently reduced its net expenditures on the services described above by \$140 million, or 30 per cent, over the four-year period ending 1998/99. While the net expenditures reflect a reduction of \$50.8 million, or ten per cent, there are factors that distort the numbers and give this lower appearance. Reductions had been made since 1994/95, which was prior to CCG's merger with the

DFO. In 1996/97, DFO's fleet of vessels was merged with Coast Guard's fleet and became part of Coast Guard's overall expenditures. This resulted in a higher net expenditure that distorted the reductions already made by Coast Guard. In addition, 1998/99 reflects expenditure forecasts to year-end and will not be finalized until the end of the fiscal year.

Table 12-21 shows the Canadian Coast Guard's revenues and expenditures for the fiscal years 1995/96 to 1998/99.

The Coast Guard also implemented user fees for some programs. The objective behind user fees is to obtain a fair contribution from users for





programs from which they directly benefit. Initially, the Marine Navigation Services Fee was introduced in June 1996. It offsets, on average, 27 per cent of the full costs of providing marine navigational services to the commercial shipping industry.

In September 1997, a Maintenance Dredging Services Tonnage Fee for the St. Lawrence Ship Channel came into effect. The current fee schedule is effective September 1, 1998 until August 31, 1999. This fee is only an interim measure to cover the total costs incurred by the Coast Guard to provide these maintenance dredging services. The Coast Guard is currently working with representatives of the commercial marine transportation industry to arrive at a long-term arrangement, including discussions on the transfer of responsibilities to industry for these dredging services.

Following the government's March 1997 announcement, the Minister of Fisheries and Oceans outlined on December 4, 1998, the elements of a revised ice-breaking services fee (ISF) proposal that would generate \$6.65 million annually plus administrative costs. The proposal is built around a transit-based ice-breaking fee. The fee will be uniformly applied to each transit to, from, or within the ice zone during the ice season.

Table 12-22 shows the breakdown of the Coast Guard's revenues and expenditures by its five main services for the fiscal year 1998/99.

## AIR TRANSPORTATION INFRASTRUCTURE

## AIR NAVIGATION SYSTEM

The Canadian Air Navigation System (ANS) consists of seven area control centres (ACC) and over 100 airport control towers and flight service stations. These facilities are supported by a network of 1,400 navigational and landing aids. One of the safest and most extensive networks of air infrastructure in the world, this system delivers air traffic control, flight information, weather briefings, airport advisory services and electronic aids to navigation.

NAV Canada, a private, nonshare capital corporation, assumed responsibility for all civil air navigation services in Canada on November 1, 1996. NAV Canada shares responsibility for air navigation safety with the Minister of Transport. The Minister retains the mandate to oversee the safety of NAV Canada's operations by ensuring that the corporation continues to meet all safety and regulatory requirements.

#### **Air Navigation Operations**

NAV Canada continued to finetune its operations in 1998 by reducing duplication and administrative costs. During the fiscal year, the corporation consolidated its Central and Western Region administrations. It is continuing with additional consolidations in regional offices and area control centres.

The air navigation system supported some 7.6 million aircraft arrivals and departures at Canadian Airports in 1998.

Figure 12-11 shows the distribution of aircraft movements by category of airport from 1993 to 1998.

Figure 12-12 charts the number of aircraft flights per traffic controller from 1994 to 1998.

The data indicates a slight shift from airports with towers to those with flight service stations and other airports. The annual number of controlled flights has risen from 4.9 million in 1994 to 5.5 million in 1998, an increase of 13.2 per cent (see Table 12-23). Flights per air traffic controller have risen slightly more by 13.5 per cent over the five-year period. Note, however, that the latter is a broad indicator only, and that to truly reflect workloads, calculations must be done on a site-by-site basis.

#### System Improvements

NAV Canada has invested approximately \$300 million since November 1996, with many projects coming on stream in the fiscal year 1997/98. These projects include

• new air traffic control towers in Halifax and Toronto;

### TABLE 12-23 CANADA'S AIR NAVIGATION WORKLOAD INDICATORS 1994 - 1998

	Annual Flights <sup>1</sup>	Air Traffic Controllers <sup>2</sup>	Flights/ Controller
1994	4,857,003	1958	2481
1995	4,881,158	1959	2492
1996	4,960,219	1927	2574
1997	5,059,590	1956	2587
1998³	5,498,100	1952	2817

- 1 Flights include (IFR + VFR + Runway 88's(for towers, and FSS) + over flights + 7% oceanic) 2 Licensed operational controllers
- 3 Includes preliminary statistics for December 1998

Source: Nav Canada

- extensive work on navigational facilities associated with the expansion of Lester B. Pearson International Airport, in conjunction with the Greater Toronto Airport Authority;
- implementing reduced verticalseparation criteria over the North Atlantic to permit increased traffic flow at the same levels of safety;
- installing new power systems and computer display technology at all Area Control Centres;
- installing new Instrument Landing Systems (ILS) at major locations such as Vancouver International Airport;
- expanding the Technical Systems Centre in Ottawa, now the main focus of NAV Canada's national engineering activities; and
- making significant progress on a major addition to our Area Control Centre in Montreal, in conjunction with the Department of National Defence.

NAV Canada's major capital project, the Canadian Automated Air Traffic System (CAATS), also reached a milestone. 83 per cent of the CAATS system software has been delivered. Factory acceptance testing will take place early in 1999, with pilot sites in Western

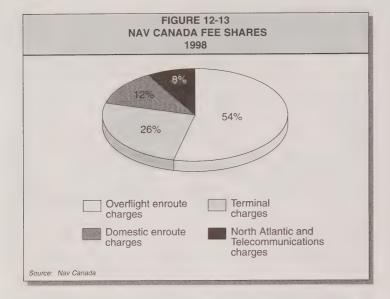
Canada to follow. It is expected that once CAATS becomes operational, it will be among the most advanced and comprehensive air traffic control systems in the world.

#### **Financial Performance**

### Proposed Service Fees

Since November 1998, NAV Canada has been a self-funded organization that charges fees for services provided to its customers. In 1998, the corporation developed:

- a new billing system;
- a fee structure in consultation with users and other stakeholders, combined with a new system for charging new terminal and en-route fees beginning March 1998;
- a pricing policy that permits exemptions, with the vast majority of general aviation users to pay a \$60 annual fee;
- deferral of the implementation of the Phase II fee schedule to March 1, 1999, from November 1998, resulting in an estimated \$72 million in savings to the flying public; and
- a rate-stabilization reserve account to minimize the impact of unforeseen fluctuations in air traffic volumes.



FINANCIAL SUMMAR	E 12-24 RY FOR NAV CANADA nd 1998	
Total revenue (\$ millions)	1998	1997
Total Revenue	892,490	776,284
Total Expenses	714,682	584,487
Operating Income	177,808	191,797
Operating Ratio	80.1%	75.3%
Net Income	5,981	13,404
Capital expenditures	126,488	176,102
Source: Nav Canada Annual Report 1998		

As a not-for-profit corporation, NAV Canada prices its services to recover all costs from users, including any debt-servicing costs. Before the creation of NAV Canada, air navigation services were funded mainly through the Air Transportation Tax (ATT). As of November 1, 1998, NAV Canada must recover its costs through user fees only. During the year, the corporation introduced new user charges for en route and terminal control services and

increased existing oceanic and overflight fees. These fees received statutory approval from the Minister of Transport, under the guiding principles of the *Civil Air Navigation Services*Commercialization Act, and the ATT was repealed. Together, the overflight fee and terminal charges contribute 80 per cent of NAV Canada's revenues.

Figure 12-13 shows the fee sources of NAV Canada in percentage terms for 1998.

Table 12-24 compares financial results for 1997 and 1998 ending August 31, 1998.

For the year ending August 31, 1998, NAV Canada reported \$892 million in revenues and \$715 million in operating expenses. Other items, such as a total \$171 million in interest payments, depreciation and restructuring expenses, resulted in a net income of \$5.9 million.

Compared with the ten-month period in the previous year, revenues increased by 15 per cent, while expenses rose 22 per cent. This resulted in an elevated operating ratio of 80 per cent. Increases in interest and depreciation charges also contributed to a reduction in net income of 55 per cent.

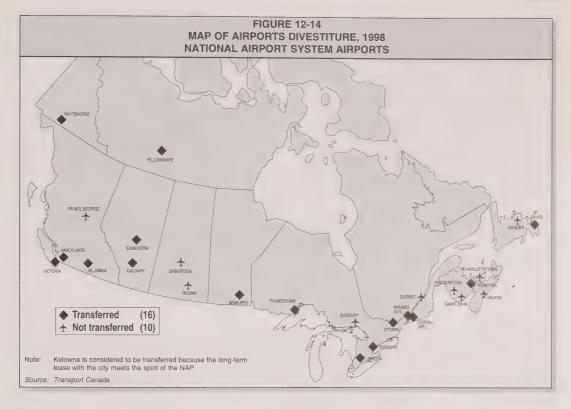
#### **AIRPORTS**

Canada has approximately 1,800 aerodromes (the generic name for facilities registered with Transport Canada as aircraft landing and take-off sites), of which 631 are certified (as either airports for fixed-wing aircraft, heliports for helicopters, or water-ice bases for float- and ski-planes).<sup>10</sup>

The majority of certified airports are owned by municipalities, provincial or territorial governments, or the federal government. Most of Canada's commercial aviation activity takes place at certified airports.

The federal government's 1994 National Airports Policy (NAP) announced its intent to commercialize most federally owned airports by March 31, 2000. This policy shifts the costs of

<sup>10</sup> This represents the latest count for 1998. Figures for the number of certified airports in Canada are dynamic due to the changes or clarification in the criteria for certified airports as established in the Canadian Aviation Regulation (CAR), Part III - Aerodromes and Airports (October 1996). Application of the new regulations has resulted in a decline of certified airports due to the elimination of the criteria "main base for flight training unit" while the number increases due in part to a clarification of the criteria "within a built-up area" premise and the new criteria where the Minister determines that an airport certificate would be in the public interest and for safety reasons.



operating Canada's airports from all federal taxpayers to only those people who use the facilities.

Under the new policy, the federal government continues to own the airports that make up the National Airport System (NAS), but will divest the airports' operations to not-for-profit airport authorities under long-term leases (with the exception of Yellowknife and Whitehorse, which have been transferred to the territorial governments). Ownership of regional, local and small airports is being transferred to local interests by way of sale. Those remote airports11 providing year-round access to isolated communities will continue to receive federal assistance.

Figures 12-14, 12-15 and 12-16 show the location of each airport considered under the NAP, the airport's designation (whether NAS, Regional/local, Small, Arctic, or Remote), and its divestiture status as of December 31, 1998.

Table 12-25 illustrates how the airport-divestiture program has evolved. Of the 136 airports designated for divestiture under the NAP, only 39 remain to be transferred at the end of 1998.

In 1998, airports in London, Ontario, and St. John's, Newfoundland, were transferred to Canadian Airport Authorities, bringing the total number of NAS airports transferred to 15. Ninety-five per cent of commercial air travel passes through airports run by independent airport authorities or operators.

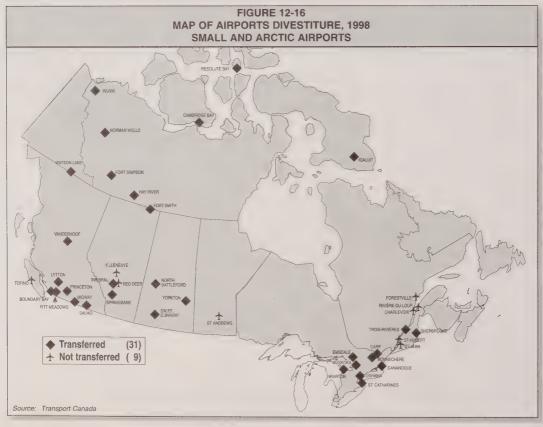
#### **Major Developments**

Over the past year, airport authorities actively pursued improvements to the infrastructure, operations and customer service at their airports.

- Vancouver Airport Authority
  has undertaken extensive
  renovations to the domestic
  terminal and has begun work on
  a major expansion of the
  international terminal.
- The Victoria Airport Authority announced plans to expand the airport's cargo capacity.

<sup>11</sup> The 1997 report mistakenly indicated 12 remote airports. There are 13. They are Sandspit, B.C.; Fort Chipewyan, Alta.; Churchill, Man.; Norway House, Man.; Moosonee, Ont.; Iles-de-la-Madeleine, Que.; Lourdes-de-Blanc-Sablon, Que.; Kuujjuaq, Que.; Waskaganish, Que.; Chevery, Que.; Wemindji, Que.; Schefferville, Que.; Eastmain River, Que.





## **TABLE 12-25** ANNUAL STATUS OF FEDERAL AIRPORT DIVESTITURES

			AS OF DECE	MBER 31, 199	98		
			Transfers Complete	ed		Completed	Remaining
Airport Category	Total to Transfer	Prior Years	1995-1996	1996-1997	1997-1998	1998-1999	1998-2000
National Airport System (NAS)	26	Vancouver Calgary Edmonton Mirabel Dorval	Yellowknife <sup>1</sup>	Whitehorse¹ Ottawa Toronto(PIA) Winnipeg	Moncton Thunder Bay Victoria	Kelowna <sup>2</sup> London St. John's	Charlottetown Fredericton Gander Halifax Prince George Québec Regina Saint John Saskatoon³ Sudbury
Regional/ Local	70		Brandon Campbell River Charlo Dawson Creek Dryden Flin Flon Fort Frances Gillam Gore Bay Kenora Prince Albert Rainbow Lake Red Lake	Abbotsford Alma Castlegar Chatham Churchill Falls Comox Dauphin Fort St. John Grande Prairie Hamilton Lethbridge Lynn Lake Nanaimo	Earlton Gaspé Kamloops Kapuskasing La Ronge North Bay Prince Rupert Quesnel Samia Sault Ste Marie Stephenville Sydney Uranium City	Deer Lake Goose Bay Windsor	Baie Comeau Fort Nelson Havre St.Pierre Mont Joli Powell River Port Hardy Rimouski St. Anthony Sept Îles Smithers Timmins (07.99) Terrace Thompson
				Peace River Pembroke Rouyn St.Leonard The Pas Williams Lake Cranbrook	Yarmouth		Toronto Island Natashquan (2000+) Wabush Bagotville Penticton Val d'Or Fort McMurray
Small	31	Trois-Rivières	Emsdale Lytton Midway Princeton Swift Current Vanderhoof Yorkton	Bonnechere Carp Gananoque Innisfail Muskoka North Battleford Oshawa St.Catharines Wiarton	Boundary Bay <sup>4</sup> Pitt Meadows <sup>4</sup> Salmo Sherbrooke Springbank <sup>4</sup>		Red Deer Tofino Charlevoix Forestville Rivière-du-Loup St. Andrews <sup>4</sup> St. Jean Saint-Hubert <sup>4</sup> Villeneuve <sup>4</sup>
Arctic	9		Cambridge Bay Fort Simpson Fort Smith Hay River Inuvik Iqaluit Norman Wells Resolute Bay	Watson Lake			
TOTAL	136	6	29	34	22	6	39

Source: Transport Canada

<sup>1</sup> These are considered Arctic airports as well.
2 Kelowna is considered to be transferred because the long-term lease with the city meets the spirit of the NAP.
3 Saskatoon transferred on January 1, 1999.
4 Satellites.

TABLE 12-26 1997 AIRPORT AUTHORITIES FINANCIAL PERFORMANCE (\$ 000)								
Financial Information	Calgary	Vancouver	Edmonton	Montreal	Toronto	Winnipeg	Ottawa*	TOTAL
Aeronautical Revenues Non-Aeronautical Revenues Airport Improvement Fee Sub-Total Revenues	26,390 31,684 2,460 <b>60,534</b>	70,971 90,910 51,699 <b>213,580</b>	13,889 14,179 10,262 <b>38,330</b>	47,556 67,205 4,721 <b>119,482</b>	153,457 121,079 0 <b>274,536</b>	11,291 10,984 0 <b>22,275</b>	13,384 13,405 0 <b>26,789</b>	336,938 349,446 69,142 <b>755,526</b>
Expenses (less Interest Charges) Income	47,844 <b>12,690</b>	148,228 <b>65,352</b>	25,454 <b>12,876</b>	106,478 <b>13,004</b>	224,930 <b>49,606</b>	18,324 <b>3,951</b>	23,531 <b>3,258</b>	594,789 <b>160,737</b>
Interest Charges Net Income	0 <b>12,690</b>	21,208 <b>44,144</b>	758 <b>12,118</b>	288 <b>12,716</b>	30,277 <b>19,329</b>	0 <b>3,951</b>	331 <b>2,927</b>	52,862 <b>107,875</b>
Acquisition of capital assets	30,789	50,987	13,568	157,880	881,501	7,233	8,377	1,150,335
Enplaned / Deplaned Passengers (000)	7,295	14,041	3,628	8,696	24,809	3,130	2,997	64,595
Ratios Operating % Aeronautical Revenues of Total % Non-Aeronautical Revenues of Total % AIF of Total Revenues	79.0% 43.6% 52.3% 4.1%	69.4% 33.2% 42.6% 24.2%	66.4% 36.2% 37.0% 26.8%	89.1% 39.8% 56.2% 4.0%	81.9% 55.9% 44.1% 0.0%	82.3% 50.7% 49.3% 0.0%	87.8% 50.0% 50.0% 0.0%	78.7% 44.6% 46.3% 9.2%
Total Revenues per passenger	8.30	15.21	10.56	13.74	11.07	7.12	8.94	11.70
Total Expenses per passenger	6.56	10.56	7.02	12.25	9.07	5.85	7.85	9.21
* Financial data is reported for 11 months from Feb Source: Airport Authority 1997 annual reports, and		nada						

- Calgary Airport Authority's 10-year capital expansion program is advancing. Projects currently underway include an extension to parking facilities, the addition of four new aircraft positions, and additional aircraft parking and taxiways.
   Additional projects are in the design stage.
- Edmonton Regional Airports
   Authority commenced work on
   a new parking facility at the
   Edmonton International Airport.
   The facility will be connected
   by an enclosed walkway to the
   terminal building's departures
   level and by covered walkways
   on the arrivals level.
- The Winnipeg Airports
   Authority announced planned
   improvements ranging from the
   installation of new elevators and
   construction of covered
   walkways to aircraft, to various
   upgrades at the terminal
   building. The authority opened a

- new observation lounge and replaced the previous food and beverage services with nine new concessions throughout the air terminal building.
- The Greater Toronto Airport
  Authority is moving forward
  with a major redevelopment
  plan that proposes such work as
  a new terminal, a new infield
  cargo area, improved de-icing
  capacity, two additional
  runways, fuel tank facilities and
  road improvements. New firefighting and fire-training
  facilities were opened, and
  additional emergency-response
  vehicles and fire fighters were
  added to the airport's
  Emergency Services department.
- The Ottawa Macdonald-Cartier International Airport Authority has also completed upgrades to the air terminal building, restaurants, bookstore, newsstand and gift shops. Other work undertaken in 1998

- included a new gate to accommodate more passenger jets and a new baggage carousel to increase capacity by 33 per cent.
- Aéroports de Montréal continued to renovate and improve its facilities at the Dorval Airport.
   A new international concourse is planned.
- At Moncton, major runway reconstruction work began and will be completed in 1999.
- Halifax International Airport, the largest of the airports still operated by Transport Canada, is also undergoing major renovations and expansion. This includes centralized and expanded ticket counter space, improved baggage handling areas, and barrier-free access. The work will complement renovations undertaken by the airlines for check-in, secondlevel departure and covered walkways.

#### **Financial Performance**

In 1997/98, Transport Canada spent \$227.6 million on the operation of airports, including operating costs, subsidies and capital, while taking in revenues of \$84.4 million. It received an additional \$69.2 million in rent from the airport authorities. For fiscal year 1998/99, Transport Canada forecasts \$179 million in spending, \$78.3 million in revenues and \$191.1 million in

### Airport Authorities Revenues and Expenses

The federal government expects National Airports System (NAS) airports to be financially self-sufficient. Consequently, airport authorities, incorporated as not-for-profit organizations with no equity shareholders, fund their operations and any expansions or improvements with revenues derived from airport users, such as airlines, concessionaires, passengers, and private investors. Rent is paid by the airport authorities to the federal government, as the owner of the airport.

In recent years, AIFs have become an important and growing source of funds for major airport improvements. Vancouver was the only airport to have charged the AIF for all of 1997.

The Calgary and Winnipeg airport authorities have reached agreements with the Air Transportation Association of Canada whereby the airlines include the AIFs in their ticket prices. The other airport authorities use a different process, collecting the fees directly from passengers as they leave the terminal.

#### **TABLE 12-27** AIRPORT IMPROVEMENT FEES AT CANADIAN AIRPORTS **AT DECEMBER 31, 1998**

	Airpo Improveme		Amount Collected (\$000)
Airport	Charge per Passenger <sup>1</sup>	Date <sup>2</sup>	1997
Vancouver	\$5 - \$15 <sup>3</sup>	May 1993	51,699 (full year)
Calgary	\$5	Oct. 1997	2,460 (3 months)
Edmonton	\$5 - \$10 4	Apr. 1997	10,262 (9 months)
Montreal (Dorval)	\$10	Nov. 1997	4,721 (2 months)
Winnipeg	\$5	July 1998	
Thunder Bay	\$10	Mar. 1998	
Moncton	\$10	Oct. 1998	

- Amount collected per enplaned passenger
- Commencement of fee
  For destinations within B.C. and Yukon, \$5; other North America, Mexico and Hawaii, \$10;
- 4. For destinations within Alberta, \$5; outside Alberta, \$10

Source: Revenue data from Airport Authority Annual Reports

Table 12-27 lists the airports having AIFs, when they were started and the amount collected in 1997.

The divested NAS airports that issued annual reports for a full year in 1998 included Calgary, Edmonton, Montreal, Toronto (Pearson), Vancouver and Winnipeg. The Ottawa Airport Authority also issued an annual report, but one that covered only 11 months.

In 1997, these seven airport authorities generated total revenues of \$755.5 million, with total expenses (before interest) of \$594.8 million. The operating ratio of the group as a whole was 78.7 per cent, with individual ratios ranging from 66.4 to 89.1 per cent. Revenues from aeronautical sources of \$336.9 million represented 44.6 per cent of their total revenues as a group. Individually, the percentage of total revenues generated from aeronautical sources ranged from 33.2 to 55.9 per cent.

Non-aeronautical revenues (excluding airport improvement fees) totaled \$349.5 million, or 46.3 per cent of all revenues generated by these airport authorities. On a site-by-site basis, the percentages ranged from 37.0 per cent in Edmonton to 56.2 per cent in Montreal.

Airport improvement fees (AIFs) generated \$69.1 million, or 9.2 per cent of total revenues in 1997, with Vancouver contributing 75 per cent of the AIF total.

The seven airport authorities spent \$1.2 billion in 1997 on the acquisition of capital assets. The Greater Toronto Airports Authority represented 77 per cent of this total, which includes the purchase of Terminal 3 at Lester B. Pearson International Airport. Other major expansion projects continued at Montreal, Calgary and Edmonton. Vancouver Airport Authority invested mainly in airport infrastructure, renovating facilities, enhancing the level of service and expanding the existing facilities to meet increasing demand.

**TABLE 12-28** PROJECTS APPROVED UNDER THE AIRPORTS CAPITAL ASSISTANCE PROGRAM BY SITE AND PROVINCE, 1998

	(\$ 000)				
Province/Site	Project Description	Date Approved	Amount	Total Site	Total Province
Newfoundland			0		0
Prince Edward Island			0		0
Nova Scotia					
Sydney	Heavy Mobile Equipment Various Airside Improvements	03.07.98 15.09.98	499 3,054	3,552	3,552
New-Brunswick	At At distalling a second	00.05.00	0.4	0.4	
Bathurst Miramichi	Various Airfield Improvements Non-Directional Beacon	22.05.98 25.11.98	64 25	64 25	89
<b>Québec</b> Gaspé Rouyn	Système d'effarouchement d'oiseaux Réfection d'installations aéroportuaires	04.11.98 07.08.98	32 4,450	32 4,450	4,482
Ontario			.,	,	, -
Big Trout Lake	Gravel Crushing Project	21.09.98	672	672	
Cat Lake	Purchase and Crush Gravel - Protected	12.11.98	568	568	
Dryden	Rotating Beacon	06.10.98	10	10	
Hamilton	Security Fencing	06.10.98	802		
	Airfield Lighting Control Panel	06.10.98	25		
	Airport Security Equipment	25.11.98	67	894	
Hearst	Mobile Equipment	09.06.98	556	556	
Moosonee	Mobile Equipment - Loader	12.01.98	148		
	Airport Pavement Rehabilitation	06.08.98	2,591	2,739	
Red Lake	Selective Restoration of Runway 08-26	30.06.98	48		
	Heavy Airside Mobile Equipment - Sweeper	21.09.98	154		
	Airfield Lighting Power Centre	06.10.98	100		
	Mobile Equipment - Front End Loader	06.10.98	142	444	5,883
Manitoba	B 1 E 0W1 11 1	07.00.00	_		
Brandon	Replace Furnaces & Water Heater	27.08.98	5	45	
Dina Daak	Replace Roll-over Plow & Wing Assembly	31.08.98	40	45	67
Pine Dock	Airport Security Fence	09.04.98	22	22	67
Saskatchewan					
Fond du Lac	Refurbish Electrical Systems	28.08.98	242		
	Replacement of Heavy Mobile Equipment	01.09.98	409	651	
Prince Albert	Replacement of Heavy Mobile Equipment	26.05.98	207	207	
Stony Rapids	Refurbish Apron Lighting & Beacon	10.07.98	79	100	
Linearity on Other	Replacement of Heavy Mobile Equipment	01.09.98	381	460	
Uranium City	Replace Mobile Equipment	09.03.98	412	1 400	0.000
Alberta	Rehabilitate Airside Surfaces & Lighting	20.10.98	1,070	1,482	2,800
Fort Chipewyan	Rehabilitation of Airfield Lighting	10.07.98	801	801	
Lethbridge	Rehabilitate Taxi "B" & Apron	21.01.98	269	269	
Rainbow Lake	Airside & Groundside Pavement rehab.	13.05.98	1,142	1,142	2,212
	Amoide a Groundside Favement Teriab.	10.00.00	1,172	1,172	2,212
British-Columbia	Panlaca Caswity Fance	04 40 00	07	07	
Campbell River Castlegar	Replace Security Fence	01.12.98	27	27	
Fort St. John	Heavy Mobile equipment - Runway Sweeper Pavement rehabilitation		153	153	
Prince Rupert	Replace Runway Sweeper	27.04.98 01.12.98	1,430 165	1,430 165	1,774
Northwest Territories	· · · · · · · · · · · · · · · · · · ·	01.12.50		100	
Yukon			0		0
TOTAL			20,858	20,858	20,858
Source: Transport Canada			20,000	20,008	20,008
occide. Hanaport Gariaua					

With 64.6 million enplaned/ deplaned passengers in total, these airport authorities generated on average \$11.70 per passenger in revenues and incurred expenses of \$9.21 per passenger.

Table 12-26 summarizes these airports' financial results for the calendar year 1997, the latest year for which figures are currently available.

#### **Review of Airport Authority Leases**

Transport Canada is presently conducting a comprehensive fiveyear review of the first four Local Airport Authorities (LAAs): Vancouver, Montreal (Dorval and Mirabel), Calgary and Edmonton. As public institutions, the LAAs are held to a high standard of public accountability, and the review will assess the extent to which the public interest is being served and protected. The review is expected to be completed in 1999.

## Airport Capital Assistance Program

An integral part of the National Airports Policy is the Airport Capital Assistance Program (ACAP). Transport Canada established this contribution program in April 1995 to help eligible airports finance capital projects related to safety, asset protection and operating-cost reduction. To be eligible, the airports must receive a minimum of 1,000 regularly scheduled passengers annually, meet airport certification requirements and not be owned by the federal government.

TABLE 12-29						
AIRPORTS CAPITAL ASSISTANCE PROGRAM						
<b>EXPENDITURES BY PROVINCE, 1996 – 1998</b>						

EXTENDITORIES BY 1110 VINCE, 1930 - 1930								
	(\$ 000)							
Province	1995/96	1996/97	1997/98	Total				
Newfoundland	-	-	-	-				
Prince-Edward-Island	-	-	-	-				
Nova Scotia	-	-	-	-				
New Brunswick	509	885	1,087	2,481				
Québec	-	-	3,203	3,203				
Ontario	909	3,233	13,465	17,607				
Manitoba	151	172	970	1,294				
Saskatchewan	-	2,877	452	3,328				
Alberta	90	815	1,129	2,034				
British Columbia	33	1,417	880	2,330				
Northwest Territories	-	-	~	-				
Yukon	-	-	-	-				
Total	1,693	9,399	21,186	32,277				
Source: Transport Canada								

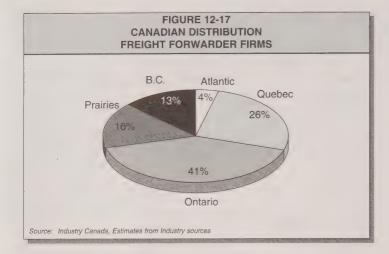
In 1998, 36 projects at 25 airports were approved for funding. The total approved funding for 1998 was \$20.9 million. Approved projects included the rehabilitation of runway, taxiway and apron pavements; the purchase of mobile equipment, such as runway sweepers and snow blowers; the purchase and installation of visual aids; and the installation of security fencing.

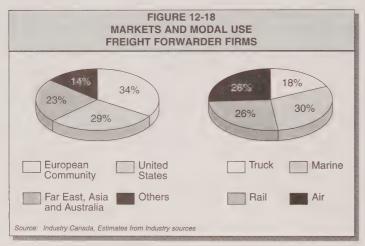
Table 12-28 lists the projects receiving funding approval under the Airport Capital Assistance Program, by site and province, in 1998.

A total of \$32.3 million has been spent since the program's inception, with 55 per cent being spent at Ontario sites up to 1997/98.

Transport Canada is evaluating the ACAP to meet the Treasury Board's requirement to assess and report on the program's performance.

Table 12-29 summarizes ACAP expenditures in each of the last three fiscal years by province. (Appendix 12-1 provides additional site-specific information for the latter period.)





### FREIGHT FORWARDERS

The freight-forwarding industry consists of companies that arrange transportation and other services for the delivery of goods. Among the services they provide are packaging, storage, handling, export credits, insurance, documentation, and customs clearance.

Forwarders can often realize economies of scale by consolidating shipments, thereby providing the owner or shipper of the goods with lower transport costs. Forwarders are important for trade because they can create low-cost transportation linkages. Large multinational and integrated firms that control a substantial portion of the Canadian forwarding market can route shipments to take advantage of the lowest transportation rates and border processing efficiencies in the US and Canada.

Most firms (about two thirds) are located in Ontario and Quebec. The use of modes is fairly evenly split between air, rail and marine, with a somewhat lower share moving by truck.

Figures 12-17 and 12-18 show the distribution of firms, their use of transport modes, and the markets they serve, according to the most recent data available from Industry Canada.

### WAREHOUSES

Just as transportation and trade are inextricably linked, so are trade and customs. All traded goods must be carried across borders, which involves the consideration and application of customs regulations. In Canada, an infrastructure component that facilitates this is the customs warehouse.

Customs Sufferance Warehouses (CSWs) are privately owned and operated facilities licensed by Revenue Canada for the control, short-term storage and examination of in-bond goods until they are released by them or exported from Canada. Licences tend to be mode-specific or multimodal.

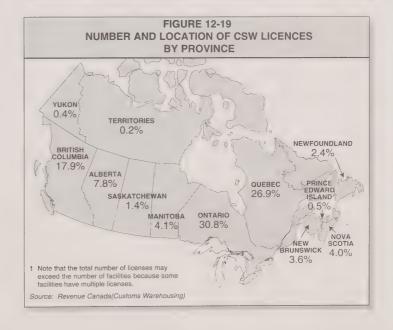
CSWs are an integral part of the customs clearance process, directly supporting the international trade interests of the Canadian business community. It is estimated that close to 5.6 million shipments were processed at CSWs in fiscal 1997/98.

It is expected that the trend toward facilities with multimodal licences will probably increase, because it minimizes handling and thereby improves the efficiency of transporting goods to their ultimate destination.

Table 12-30 summarizes the attributes of the estimated 1,200 licenced CSWs, their transport modes' affiliations, and the type of organization that operates them.

Figure 12-19 indicates the percentage of and location of CSW licences by province.

#### **TABLE 12-30** CANADA SUFFERANCE WAREHOUSES **BY MODE, 1998** Mode Quantity Operated by Air 125 Airline Companies Marine 10 Marine Companies 51 Harbour Commissions, Stevedoring Companies, etc. Rail 170 Railway Companies (includes Rail yards and bonded 97 Private railway siding operated by importers of carload goods Air/Marine/Rail 37 Cargo handlers for any of the above Highway 128 Third party, for goods arriving in highway mode. This type of sufferance warehouse is restricted to one per city, with the exception of Montréal and Toronto where there are three at each location. 52 Highway carrier leasing space in a Sub-type BW sufferance warehouse All Modes 336 Consolidator, De consolidator, Freight forwarder, etc. 114 Third party, for household goods and personal effects 6 Operators of fresh fruit and vegetable terminals 79 Publicly and privately operated for the storage of other specific commodities (bulk products, lumber, etc.) Source: Revenue Canada(Customs Warehousing)



#### **APPENDIX 12-1** AIRPORTS CAPITAL ASSISTANCE PROGRAM EXPENDITURES BY SITE AND PROVINCE, 1995/96 - 1997/98

		(\$ 000	))			
Province/Site		1996	1997	1998	Site Total	Province Total
British Columbia	a Campbell River	-	8	838	846	
	Qualicum Beach	-	371	42	413	
	Bella Coola	33	1,038	-	1,071	2,33
Alberta	Fort Chipewyan	_	63	_	63	
	Grande Prairie	-	-	33	33	
	Medicine Hat	90	753	336	1,179	
	Peace River	-		621	621	
	High Level	-	-	138	138	2,03
Saskatchewan	Prince Albert		_	101	101	
	Stony Rapids	-	2,877	171	3,048	
	Wollaston Lake	-	-	180	180	3,32
Manitoba	Dauphin	_	_	265	265	
nainto ba	Gillam	_	_	421	421	
	Swan River	_		9	9	
	God's River	151	172	19	342	
	Pine Dock		-	257	257	1,29
Ontario	Wapekeka/Angling Lake	631	18	_	648	
Omano	Hamilton (Mount Hope)	-	-	5.533	5.533	
	Moosonee	_	1,073	120	1,193	
	Nakina	_	-	263	263	
	Pelee Island	-	563	1,206	1,769	
	Sarnia	-	-	152	152	
	Kingston	279	504	**	782	
	Kirkland Lake	-	-	150	150	
	Chapleau	-	-	374	374	
	Marathon	-		250	250	
	Manitouwadge	-	252	257	509	
	Sioux Lookout	-	-	401	401	
	Fort Frances	-	-	281	281	
	Elliot Lake	-	393	-	393	
	Cochrane	-	-	262	262	
	Geraldton	-	-	388	388	
	Wawa	-	-	2,905	2,905	
	Hornepayne	-	431	924	1,355	17,60
Quebec	Roberval		-	9	9	
	Alma S.B.	-	-	739	739	
	La Grande	-	-	807	807	
	Chisasibi (Fort George	-	-	1,648	1,648	3,20
New Brunswick	Charlo	-	51	350	401	
	Chatham		-	380	380	
	Bathurst	509	834	19	1,363	
	St. Leonard	-	-	338	338	2,48
TOTAL		1,693	9,399	21,186	32,277	32,27

# Industry Structure

The changes to the transportation industry structure came from divestiture of a portion of a carrier's operations; sales and acquisitions; mergers; or simply from carriers ceasing to operate or going bankrupt.

The evolution of the market structure of each mode of transportation is shaped, to a large extent, by competitive forces. The structure of each modal transportation industry is one of a number of factors that come together to explain the evolution of Canada's transportation system.

The number of carriers, their relative size, the markets they served, the relative importance of their presence in the market place, are important determinants of the level and degree of competition in the market place. Price changes, financial results, and even carrier's specific changes in traffic levels have, at their outset, the industry

structure and the factors that are modifying it.

Each mode has some unique economic characteristics. These characteristics call for different organizational arrangements, delimit the number of different firms sustainable by the market. Competition in transportation, within and between modes, is closely connected to the question of consolidation and integration. For each mode, consolidation presents different issues.

This chapter presents an overview of Canada's transportation industry structure in the five modes — rail, trucking,

bus, marine and air. It highlights the services each mode provides, at the national, regional and international levels and looks at the major events for the year, including legislative and regulatory changes.

# RAIL TRANSPORTATION INDUSTRY

# RAIL FREIGHT TRANSPORTATION

Canada's railways provide the most economical method of moving containers and bulk commodities over great distances.

# TABLE 13-1 MAJOR SHORTLINE OPERATIONS IN CANADA 1998

1998							
Corporation	Owned/Leased Trackage (Kilometres)	Number of Canadian Railways Controlled					
RaiLink	2,175	5					
OmniTRAX	1,830	3					
SCFQ¹	1,026	5					
Genesee Rail-One	796	3					
Railtex	707	3					
Iron Road <sup>2</sup>	393	3					

1 Société des Chemins de fer du Québec

2 Does not include Northern Vermont which does not own track in Canada or the Bangor and Aroostock which only comes a short distance into Canada.

Source: Transport Canada

The two Class I¹ freight railways, CN and CP Rail, continue to dominate the Canadian rail network (and rail activity in general). The relative importance of their privately owned network has declined from 78.1 per cent of the national network in 1997 to 73.3 per cent in 1998 (as measured by route-kilometres) with the transfer of lines to other operators.

Since the passage of the Canada Transportation Act in July 1996, the number of railways providing rail services in Canada has increased significantly. Some 23 new rail carriers have sprung up,<sup>2</sup> increasing the ranks of the regional and shortline railway community. In 1998 alone, eight new railways came into being, while additional amounts of track were transferred to existing carriers.

The extent of the rail network that these newly created railways operate over has also increased significantly since mid-1996. In addition to the Class I railways (including VIA Rail) and the regional and shortline carriers, there are a significant number of carriers with relatively limited infrastructure and/or operations in

Canada. These include the subsidiaries of US carriers that travel into Canada, terminal railways and railway bridge companies. Appendix 13-1 gives a full listing of railways operating in Canada and the regions in which they operate.

Although about 50 shortline and regional carriers presently operate in Canada, most of the shortlines formed in the past several years are controlled by a group of six corporations. In aggregate, these corporations account for about 89 per cent of regional and shortline trackage transferred and 71 per cent of all regional and shortline carriers created since 1996.

Almost all of the trackage transferred in 1998 was to railways controlled by these corporations, three of which are US-based (OmniTRAX, Railtex and Iron Road). Quebec-based Genessee Rail-One is backed financially by US-based Genessee-Wyoming. The other corporations are Canadian-based, with RaiLink headquartered in Alberta, and Société des chemins de fer du Québec (SCFQ) headquartered in Quebec. The activities of the

Canadian-based corporations are for the most part concentrated in the areas in which they are headquartered. RaiLink also has a 25 per cent financial interest in SCFQ, but presently has no operational linkages. This could change in the near future as a result of recent acquisitions in Ontario, which have created physical linkages between the carriers.

Table 13-1 summarizes the nature of concentration within the Canadian shortline industry.

# RAIL PASSENGER TRANSPORTATION

VIA Rail operates four passenger services: the Quebec-Windsor corridor, western transcontinental service (between Toronto and Vancouver), eastern transcontinental service (Montreal–Halifax and Montreal–Gaspé) and northern services (in Quebec, Ontario, Saskatchewan and British Columbia).

In addition to VIA Rail, there are a number of regional, commuter and tourist railways that make up the passenger rail service network in Canada. Of these, BC Rail operates the largest non-VIA service.

Three carriers offer passenger services in remote or isolated regions: the Algoma Central Railway, the Ontario Northland Railway, and the Quebec North Shore & Labrador Railway. They have all operated under contract with Transport Canada since the *Canada Transportation Act* came into effect in 1996. Previously, they were directly subsidized by the federal government.

- 1 Class I railways are generally defined to include CN and CP Rail as well as VIA Rail Canada. Class II railways include those known variously as regional and shortline railways, while Class III railways encompass those activities that are principally confined to terminals or bridges.
- 2 Several of these railways do not have separate operations from other railways operating under the same corporate umbrella.

The Algoma Central operates between Sault Ste. Marie and Hearst, Ontario; the Ontario Northland runs between Toronto and Cochrane (with only the portion between Toronto and North Bay receiving federal government subsidies); and the Quebec North Shore & Labrador runs between Sept Îles, Schefferville and Labrador City.

Table 13-2 provides route length and total government subsidies for the three non-VIA remote passenger services in 1997.

In 1988, VIA inaugurated a seasonal daylight service between Vancouver, Calgary and Jasper called the Rocky Mountaineer in response to requests from tour operators for a day train through the mountains. When VIA was directed in 1990 to privatize its operations wherever possible, the Rocky Mountaineer route was sold to the Great Canadian Railtour Company. The company operates along CP and CN lines through the Rocky Mountains from early May through October.

There are two US passenger rail services operating in Canada. Amtrak, the American equivalent of VIA Rail, provides passenger rail services between New York City and Montreal, as well as services between Vancouver and Seattle, while the White Pass and Yukon railways operate a tourist train service between Skagway, Alaska, and Bennet, Yukon, during the summer season.

### TRUCKING INDUSTRY

The trucking industry plays a large role in Canada's economy, accounting for significant revenues and jobs. Recent estimates indicate annual revenues of approximately \$38.5 billion in 1997 (See

TABLE 13-2 NON-VIA RAIL REMOTE PASSENGER SERVICES 1997					
	Algoma Central Railway	Ontario Northland Railway	Quebec North Shore and Labrador Railway		
Route Length	296 miles (Sault Ste. Marie to Hearst)	472 miles (Toronto to North Bay to Cochrane)	260 miles (Sept Îles to Labrador City) 129 miles (Ross Bay Junction to Schefferville)		
Annual Passengers	15,950	45,952	16,046		
Government Subsidy	\$1.6 million	\$1.6 million	\$1.6 million		
Source: Transport Canada					

Figure 13-1) There are 3.7 million trucks registered in Canada; many of these trucks are pickups, vans and other small vehicles. Roughly 700,000 of these trucks are estimated to be large trucks, that is, trucks with a registered weight of 4.5 tonnes or more.

Approximately 420,000 trucks in Canada haul freight commercially, with equipment ranging from 2- and 3-axle straight trucks to 18-wheel tractor trailers. An additional 280,000 trucks are used in non-commercial trucking, including farming, government operations, and a wide variety of utility and service functions.

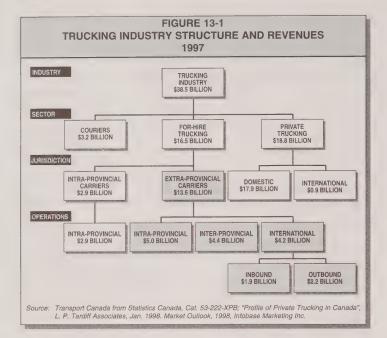
Trucking is a highly diversified industry. Based on recent estimates, there are approximately 10,600 for-hire carriers (with annual revenues exceeding \$30,000), 450 private carriers (with annual operating expenses exceeding \$1 million), and 2,400 courier companies, for a total of 13,500 carriers.

In addition, there are 40,000 owner-operators, with annual revenues exceeding \$30,000, who sell their services to either private or for-hire carriers, or a combination of the two. There are also small private carriers, as

well as organizations such as farms, utility companies and municipalities that own and operate trucks.

Trucking companies can be further differentiated according to their operating characteristics, such as:

- size, ranging from the single unit owner-operator to large firms operating several hundred power units;
- equipment used, whether its specialized logging trucks, hopper-bottom grain trailers, general purpose vans, or flat-deck trailers;
- geographic coverage of the service offered, including operating locally within the province (intraprovincial carriers); into other provinces (interprovincial carriers); or into the United States and Mexico (extra-provincial carriers);
- type of services offered, from truckload services (full load / single shipper) to less-thantruckload services (multiple shipments from multiple shippers); and
- alliances, including handling general freight in one region, while interlining with other



carriers to serve other regions, or other countries.

Figure 13-1 shows trucking industry structure and revenues for 1997.

### Major Trucking Events in 1998

Legislative and Regulatory

Review of the Motor Vehicle Transport Act, 1987

Transport Canada pursued its consultation with provinces and stakeholders on proposed changes to the MVTA. The federal Minister of Transport issued a Position Paper in February 1998 outlining a series of proposed changes intended to establish a regulatory framework which focuses on carrier safety performance and ensures consistent regulatory treatment of extra-provincial motor carriers.

Both the federal government and the provinces have constitutional

jurisdiction of some aspects of motor carriers operations in Canada. The proposed changes being considered would maintain the existing framework for provincial regulation of extraprovincial motor carriers.

Consultations also focused on the need to ensure consistency in the application to extra-provincial carriers of provincial regulations on conditions of carriage.

## Internal Trade and National Harmonization

Each year, federal and provincial transportation ministers report on progress with the implementation of the transportation chapter commitments in the Agreement on Internal Trade. In 1998, the third annual report stated that the transport sector was generally meeting its harmonization objectives in the implementation of the national safety code, among other things.

#### Vehicle Weights and Dimensions

Vehicle weights and dimensions have a profound effect on trucking costs, productivity, competitiveness and infrastructure costs. Because of their importance, an interjurisdictional task force, the Task Force on Vehicle Weights and Dimensions Policy, reports to the Council of Deputy Ministers Responsible for Transportation and Highway Safety, co-ordinates policy through collective action, and acts as a forum for the exchange of information on provincial initiatives.

In 1997, task force consultations with industry stakeholders led to 16 recommendations that called for greater national uniformity in vehicle weight and dimension regulations. Nine of the 16 recommendations were implemented in July 1998. They standardize dimensions for box length, tractor-trailer connections, spacing between axles and axleload limits. Most reflect current usage and conditions, while others represent changes that jurisdictions are willing to make to promote harmonization.

Discussions with stakeholders continued in 1998 on the remaining seven recommendations, which are primarily related to axle group load limits. These, and a number of additional recommendations for special permit conditions for oversize and overweight vehicles, remain under discussion as possible future amendments.

Work also continued on a number of regional initiatives designed to improve the compatibility of requirements and conditions applicable to loads or vehicles that move between jurisdictions. These initiatives concern uniformity of definitions; and rules and policies for special equipment, such as snowplows and emergency vehicles, auto carriers, hay balers, and combines. The intention is to establish regional agreements as a stepping stone to eventual national uniformity.

#### **NAFTA**

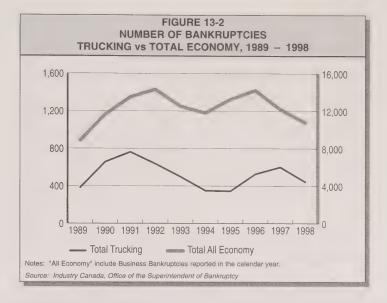
NAFTA's Land Transportation Standards Subcommittee and Transportation Consultative Group continued to work toward compatible technical standards and to overcome barriers to efficient cross-border truck traffic in Canada, Mexico and the US. In 1998, the groups focused on motor carrier safety assessment processes, exchanging motor carrier data, vehicle weight and dimension compatibility, and developing a North American dangerous goods code.

On the North American front, compatibility of vehicle size and weight regulations presents a major challenge, given the wide range of technical, economic, and policy issues of each country. In 1998, the trilateral working group on vehicle weight and dimension standards reached an agreement on the principle of employing vehicle performance criteria as a key consideration in the pursuit of regulatory harmonization.

#### **Industry Events**

As in previous years, 1998 had its share of mergers and acquisitions of motor carriers. Examples involving some of the larger Canadian carriers, include:

 the acquisition of less-thantruckload carrier Atomic Transportation System of Manitoba by Alberta-based Prime-Link Group Ltd. to combine their operations and conduct business under Atomic TCT (May 1998);



- the acquisition of Christie
   Transport of Ontario by Ontario-based Contrans Corp. to expand its dry van, flatbed and bulk hauling services in Canada and the US (May 1998);
- the acquisition of Economy Carriers Ltd. of Alberta, which specializes in chemical hauling transportation, by Alberta-based Trimac Transportation (June 1998);
- the acquisition of Quebec-based Enterprises de Transport, a truckload carrier, Transport Lebon Inc., a carrier specializing in bulk merchandise (April 1998), and Transport M. Courchesne of Quebec, a carrier specializing in the transport of bulk merchandise, by Cabano Kingsway of Quebec (July 1998);
- the purchase of a 40 per cent interest in Ontario-based Mill Creek by Mullen Transportation of Alberta to jointly market their trucking and logistics services throughout North America (July 1998); and
- the acquisition of Ontario-based Concord Transportation Inc. by

Clarke Inc. of Ontario to expand its expedited freight services in Canada and the US (August 1998).

In transborder operations, Canadian carriers use partnerships with US-based carriers to penetrate the US market. These alliances allow carriers to offer overnight, next-day and second-day delivery services over a much broader territory. In addition, such alliances can lead to the integration of the carriers' information systems and the sharing of invoicing and inventory control systems. In 1998, there were numerous mergers. acquisitions and alliances on both sides of the Canada-US border, some examples include:

• the continued expansion of Ontario-based Vitran Corporation Inc. into the US with its purchase of Quast Transfer Inc. of Minnesota, which in combination with its existing US subsidiary, Overland Transportation Systems Inc., will form one of the largest less-thantruckload carriers in the Central States:

#### **TABLE 13-3** ANNUAL TRUCKING BANKRUPTCIES BY REGION 1987 - 1998

Year	Atlantic Prov.	Quebec	Ontario	Prairie Prov.	B.C. and Territories	Total
1987	17	32	59	136	78	322
1988	22	40	77	163	92	394
1989	27	65	58	143	88	381
1990	57	142	147	213	97	656
1991	98	107	191	223	143	762
1992	· 70	119	188	171	88	636
1993	70	91	152	130	56	499
1994	37	67	88	125	33	350
1995	31	81	58	141	34	345
1996	74	90	107	197	59	527
1997	82	119	164	178	58	601
1998	39	71	121	158	54	443

<sup>1 &</sup>quot;Truck Transport industries" include General freight, Used goods moving & storage, Bulk Liquids, Dry bulk materials, Forest products and Other truck transport industries.

Source: Industry Canada, Office of the Superintendent of Bankruptcy

#### **TABLE 13-4** FOR-HIRE TRUCKING FIRMS' REVENUES BY MARKET SEGMENT 1997

	Revenue (\$ millions)	Percentage of Total
General freight	8,363.0	58.6
Liquid Bulk	1,235.0	8.7
Dry Bulk	971.0	6.8
Forest products	794.1	5.6
Household goods	523.2	3.7
Other Specialized freight <sup>2</sup>	2,385.0	16.7
Total:	14,271.2	100.0

- - 1 For-hire trucking firms earning annually at least \$1 million;
    2 Other Specialized freight include heavy machinery, automobiles, etc. and other revenue
- Source: Statistics Canada, Annual Supplement (Q5) to the Quarterly Motor Carriers of Freight Survey -QMCF
- the merger of Trimac Transportation's Oregon and Washington-based petroleumhauling operations with Harris Transportation Co. of Portland Oregon;
- the marketing agreement between Clarke Inc. of Ontario and Landstar Logistics of Florida:
- · the acquisition of Ontario-based Gerth Transport, one of Canada's leading truckload carriers serving Mexico, by Celadon Group Inc. of Indianapolis (Gerth will continue to operate

- independently under the Celadon Group to truckload carriers); and
- · the sale of Ontario-based Challenger Motor Freight's US truckload division to M.S. Carriers of Memphis.

#### **Bankruptcies**

The number of bankruptcies in the trucking industry follows a pattern similar to that of the whole economy. Trucking bankruptcies dropped rapidly between 1991 and 1994, stabilized in 1995, then increased in 1996 and 1997. In 1998, there was a significant

decline in the level of bankruptcies in the trucking industry.

Figure 13-2 compares the number of bankruptcies in the trucking industry with those in the Canadian economy from 1987 to 1998.

Table 13-3 shows the number of trucking industry bankruptcies by region between 1987 and 1998.

#### TRUCKING SERVICES

#### For-Hire Trucking

The trucking industry can be divided into two major components: for-hire trucking and private trucking. For-hire trucking companies carry freight for a fee providing either truckload or less-than-truckload services, or a combination of the two in domestic and/or international markets.

For-hire trucking firms can be further categorized according to the types of freight they carry:

- general freight carriers handle many different types of freight in semi-trailers and general-freight trailers;
- · household goods carriers use specialized trailers to transport furniture and other personal household possessions;
- · liquid bulk carriers use tanker trucks to transport liquids, such as petroleum, milk and chemicals;
- dry bulk carriers use dump or hopper-bottom trailers to haul goods, such as grain, fertilizer and gravel;
- · specialty freight carriers use special equipment such as logging trucks to transport logs, special trailers to transport automobiles and trucks, etc.

Table 13-4 describes for-hire revenues by the type of freight carried. For-hire carriers earning annually \$1 million or more account for 86 per cent of the total for-hire trucking revenues. General freight carriers dominated the for-hire sector in 1997, accounting for near 60 per cent of for-hire revenues.

Table 13-5 shows the major forhire trucking carriers in 1998 by the size of their fleet and the type of service offered.

Figure 13-3 presents the number of for-hire carriers earning annual revenues of \$1 million or more between 1990 and 1997. The increase in the number of carriers is partly due to a new frame used by Statistics Canada to conduct its trucking survey. The number of very large carriers fluctuated between 55 and 70 firms over this period.

Table 13-6 shows the percentage share of total for-hire revenues for each size of carrier from 1991 to 1997. Very large (top) carriers are those that earn \$25 million or more annually; large carriers earn between \$12 and \$25 million; and medium carriers earn between \$1 and \$12 million.

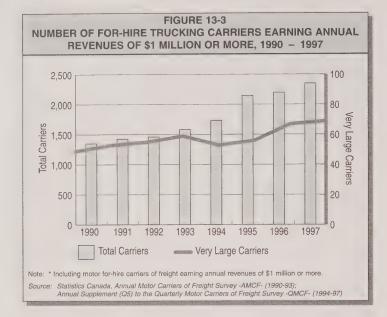
The degree of concentration between large, medium and small for-hire carriers is often a good indicator of the level of competition in the marketplace. From 1991 to 1995, revenues of very large carriers, as a percentage of total revenues, steadily decreased, suggesting a reduced level of concentration in the industry. The proportion of their revenues to total industry revenues declined from 33 per cent in 1991, to 25.4 per cent in 1997. This decrease was offset by an increase of ten per cent over the same period in the share of trucking industry revenues generated by large-sized carriers.

#### TABLE 13-5 MAJOR FOR-HIRE CARRIERS, BY SECTOR 1998

Total	N		
Total	Name of		0 1
Vehicles		rovince	Sector
4,322	Trimac Transportation Services	AB	В,О
3,198	J.D. Irving Ltd.	NB	LTL, TL, B,C,R,O
3,050	Transx	MB	TL,R
2,961	Day & Ross Tranportation	NB	TL,LTL,R,O
2,880	Robert Transportation	PQ	LTL,TL,B,C,H,R'
2,822	Paul's Hauling	AB	LTL,B
2,655	Mullen Transportation	AB	LTL, TL, B,O
2,517	Westminster Holdings	ON	LTL,TL,C,O
2,494	SLH	ON	
2,450	Schneider National Carriers	ON	TL,LTL TL,B,O
2,380			
	Reimer Express Lines (Roadway Express)	AB	LTL,O
2,325	Cabano Kingsway	PQ	LTL,TL,B,C
2,174	Contrans	ON	LTL,TL,B,C,R,O
2,150	Highland Transport (Westminster)	ON	TL,C
2,128	Auto Haulaway	ON	0
1,956	Armour Transportation System	NB	LTL,TL,B,C,R,O
1,900	CF Group of Companies	AB	LTL,TL
1,829	Tri-Line Freight Systems	AB	LTL,TL
1,821	Challenger Motor Freight	ON	LTL,TL,C,O
1,685	Arnold Bros. Transport	MB	TL
1,683	TST Solutions	ON	LTL,TL,O
1,665	Midland Transport (Irving)	NB	LTL,TL,C,R,O
1,632	TNT Logistics	ON	TL,O
1,610	Kindersley Transport	SK	LTL,TL,C,R,O
1,610	FTI Inc. Canada	ON	TL
1,566	TST Overland Express (TST Solutions)	ON	LTL,TL
1,473	Landtran Systems	AB	LTL,TL,R
1,428	Canadian Freightways (CF)	AB	LTL,TL
1,415	Kleysen Transport	MB	LTL,TL,B,C,R,O
1,402	Wilson's Truck Lines	ON	TL
1,365	Clarke Transport	ON	LTL,TL,C
1,360	Gerth Transport	ON	LTL,TL
1,359	Trans Western Express	ON	LTL,TL
1,357	Bruce R. Smith Ltd.	ON	TL
1,353	Groupe Papineau	PQ	LTL,TL,C,R
1,342	SGT 2000	PQ	TL,C,R,O
		SK	LTL,TL,C,H,R,O
1,307	N. Yankee Transfer	ON	LTL,TL,B,O
1,295	Canada Cartage System	ON	TL
1,280	XTL Transport	ON	
1,220	Manitoulin Transport Group	ON	LTL,TL
1,190	Cooney Group		TL,B,C,O
1,185	Guilbault Transport Group	PQ	LTL,TL,C,H
1,150	Westcan Bulk Transport (Paul's)	AB	В
1,135	Mackie Moving Systems	ON	LTL,TL,H,O
1,133	Laidlaw Carriers (Contrans)	NO	TL,B,O
1,114	Verspeeten Cartage	ON	TL,C
1,110	Erb Transport	ON	LTL,TL,R
1,100	Sunbury Transport (Irving)	NB	TL,B,C,R,O
1,041	Brookville Carriers (Contrans)	NB	LTL,TL,C,R,O
1,036	Mullen Trucking	AB	LTL,TL,O
1,022	Purolator Courier	ON	LTL,O
1,017	Thibodeay Transport Group	PQ	LTL,TL,C
1,013	Canadian American Transportation	PQ	TL
1,002	BLM Group Inc.	ON	LTL,TL,B,H,R,O

Total vehicles include trucks, tractors and trailiers, as well as owner-operator equipment domiciled in Canada.
 Sector Legend: LTL - Less than Truckload; TL - Truckload; B - Dry or Liquid Bulk; C - Container;
 H - Household Goods; R - Agricultural or Refrigerated; O - Other

Source: Today's Trucking March 1998 "The 1998 Top 100 for-Hire Fleets"
Major for-Hire Trucking Firms By Size and By Type of Activities - 1998



The share of total industry revenues earned by medium carriers fluctuated between 40.3 and 39.6 per cent between 1991 and 1997. Small carriers' share of industry revenues dropped to 13.4 per cent in 1997.

#### Couriers

Couriers are another important segment of the trucking industry. They specialize in delivery of envelopes and small packages, primarily door-to-door, within Canada and around the world. This type of service often requires a combination of different transportation services, including intercity bus companies, air cargo operators and less-than-truck-load services. The domestic courier industry accounts for most of the Canadian courier business, with 95 per cent of total courier volume and 81 per cent of its total revenues in 1997.

A recent study<sup>3</sup> estimates the total revenues of the courier industry in 1997 at \$3.2 billion, on an average daily volume of 1.5 million packages delivered.

The industry is highly concentrated among nine major carriers — Canada Post, Canpar, Federal Express, Loomis, Purolator, RPS, TNT Express Worldwide and United Parcel Service. Together, they account for just over 81 per cent of all courier traffic and revenues of this segment of the trucking industry.

#### **Private Trucking**

Private trucking companies maintain a fleet of trucks and trailers to haul their own freight and to occasionally haul goods for others. In this second area, private trucking companies compete with for-hire trucking firms, and at times, they also employ for-hire carriers for some of their own freight transportation needs.

Companies with private trucking operations tend to be retail distributors of consumer goods, chemical products producers, pulp and paper companies, beverage distributors, or wholesale distributors of agricultural

TABLE 13-6				
DISTRIBUTION OF TOTAL FOR-HIRE TRUCKING REVENUES				
BY SIZE OF CARRIER, 1990 - 1997				

		Carriers 2 million)		Carriers 5 million)	1	arriers 5 million)		Carriers \$1 million)	Grand Total
Year	Revenue (\$millions)	Share (% of Total)	Revenue (\$millions)	Share (% of Total)	Revenue (\$millions)	Share (% of Total)	Revenue (\$millions)	Share (% of Total)	Revenue (\$millions)
1991	4,028.8	40.3	1,107.6	11.1	3,298.2	33.0	1,562.4	15.6	9,997.0
1992	4,217.4	41.8	1,072.2	10.6	3,256.1	32.3	1,537.3	15.2	10,082.9
1993	4,542.9	41.0	1,268.0	11.4	3,411.1	30.8	1,868.2	16.8	11,090.2
1994	5,212.8	40.4	2,208.5	17.1	3,541.4	27.5	1,929.9	15.0	12,892.6
1995	5,460.6	38.3	3,090.0	21.7	3,576.9	25.1	2,113.4	14.8	14,240.9
1996	5,731.8	37.6	3,453.2	22.7	3,917.7	25.7	2,127.1	14.0	15,229.8
1997	6,530.4	39.6	3,553.1	21.6	4,187.7	25.4	2,200.0	13.4	16,471.2

Sources: Statistics Canada, Annual Motor Carriers of Freight Survey -AMCF- (1990-93); Annual Supplement (Q5) to the Quarterly Motor Carriers of Freight Survey - QMCF- (1994-97); 1997 small carriers' revenues estimated by Transport Canada

<sup>3</sup> Courier Industry Market Sizing Study, Infobase Marketing Inc.

products. Some of the larger private truck fleet owners include Canadian Tire, Labatts, Molson, Home Hardware, Liquid Air, Kraft, General Foods, Loblaws, 3M, Ault, Brewers Retail, Consumers Distributing, DuPont, Dominion Textiles, General Electric, K-Mart and Tim Horton Donuts.

According to a recent study,4 private trucking is as important to the Canadian economy as for-hire trucking, contributing almost \$19 billion annually. Private trucking dominates the movement of freight within Canada's urban areas, accounting for approximately 85 per cent of the trucks that move goods within Canadian cities. Overall, there are twice as many private fleets as there are for-hire fleets; however, they are generally much smaller, with 90 per cent having 10 vehicles or less, and many with as few as 1 or 2 trucks. Along with smaller fleets, the private trucking industry also tends to use smaller trucks, especially for pick-up and delivery services within urban centres.

As haul distance increases, the nature of private trucking changes dramatically. At distances of 500 kilometres, private trucking accounts for about 25 per cent of all trucking movements. For these trips, private trucking operators use tractor-trailers much more frequently than the straight trucks that dominate the movement of goods within urban areas. On distances between 500 and 1,000 kilometres, private trucking accounts for about ten per cent of all trips.

The value of interprovincial, intraprovincial and transborder private trucking has been derived,

TABLE 13-7 NUMBER OF OWNER-OPERATORS HIRED BY CARRIER TYPE 1996

	For-Hire Carriers	Private Carriers	Both	Total	Revenues (\$ millions)
Newfoundland	317	81	41	439	58.9
Prince Edward Island	82	41	18	141	17.8
Nova Scotia	588	173	115	876	120.8
New Brunswick	990	478	189	1,657	235.9
Quebec	4,713	1,351	521	6,585	840.6
Ontario	9,027	3,303	956	13,286	1,653
Manitoba	1,265	548	211	2,024	277.1
Saskatchewan	1,180	466	188	1,834	264.8
Alberta	4,164	1,670	828	6,662	890.2
British Columbia	4,301	1,305	920	6,526	859.4
Yukon	20	7	4	31	
Northwest Territories	17	10	2	29	9.8
Canada	26,664	9,433	3,993	40,090	5,228.3

Source: Statistics Canada, Annual Motor Carrier Freight Survey, Surface and Marine Bulletin Vol. 15 No. 1, Cat. 50-002

on a regional basis, by applying market share percentages established by the Canadian Council of Motor Transport Administrators Roadside Surveys. However, these percentages are for longer distance trips only, and may understate short-distance private trucking movements.

Private trucking accounts for 22 per cent of total interprovincial truck movements. Interprovincially, private trucking operations are very similar to for-hire trucking; however, private trucking operators make greater use of straight trucks and have a tendency to use more specialized vehicles such as tankers and flatbeds.

Private trucking accounts for 41 per cent of all intraprovincial truck movements. Ontario and Quebec account for 75 per cent of intraprovincial private trucking movements in Canada. Private trucks are less likely to be fully loaded, use fewer owner-operators compared with for-hire trucks, and are more likely to move food, feed and beverages.

In the transborder market, private trucking accounts for about 28 per cent of all truck movements. Ontario accounts for over 50 per cent of the national total of long-distance transborder trips by private fleets, while Quebec accounts for about 25 per cent of such trips. Private trucking makes substantially more use of straight trucks than for-hire trucking on these trips

#### **Owner-operators**

Owner-operators work under contract for either for-hire or private carriers, typically using their own trucks. In 1996, there were over 40,000 owner-operators operating in Canada, with almost half them employed in Ontario and Quebec, and a further one-third concentrated in Alberta and British Columbia. Approximately two-thirds of owner-operators are employed by for-hire carriers.

Table 13-7 shows the number owner-operators hired by carrier type, as well as revenues by province for 1996.

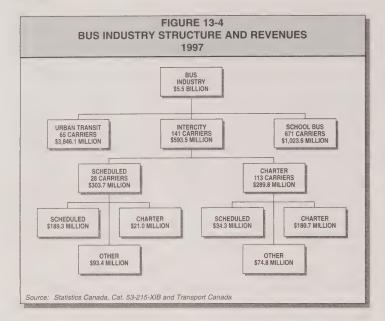


TABLE 13-8 SUMMARY OF REVENUES BY SOURCES OF REVENUE 1997						
	Intercity Bus Operators	Charter¹ Bus Operators	School Bus Operators	Urban² Transit Operators	Total	
Number of establishments	28	113	671	65	877	
Sources of revenues (\$ millions) Scheduled services Charters, sightseeing and	189.3	34.3	17.6		241.3	
shuttle services	21.0	180.7	110.9	3.6	316.2	
School/commercial contracts	3.5	19.6	799.2	3.4	825.7	
Urban and suburban services	3.6	6.4	41.5	1,620.8	1,672.2	
Other passenger services	3.9	26.6	29.9	6.9	67.4	
Parcels, subsidies and other	82.4	22.1	24.5	2,211.4	2,340.4	
Total	303.7	289.8	1,023.6	3,846.1	5,463.1	

Note: Totals may not add due to rounding.

Consists of Statistics Canada's category of "other passenger bus establishments

excluding school bus operators"
2 Includes capital subsidies for urban transit operators

Source: Statistics Canada, Cat. 53-215-XPB

# BUS TRANSPORTATION INDUSTRY

The Canadian bus industry is made up of three main lines of business: intercity carriers, urban transit and school bus operators.

Figure 13-4 shows the structure and revenues of the bus industry in Canada in 1996. Table 13-8 summarizes revenues by source of revenue for the same year.

# MAJOR BUS EVENTS IN 1998

Legislative and Regulatory Changes

Motor Vehicle Transport Act, 1987 Review

The MVTA currently allows each province to apply its own legislation and regulations to extra-provincial bus operators. Until the late 1980s, all provinces applied economic controls to most intercity and charter bus operations. A few provinces still do so, while others have relaxed their economic controls. Several have completely deregulated, or have announced their intention to do so as summarized in Table 13-9.

As a result of these developments, an extra-provincial bus carrier can be subject to different regulatory rules for its extra-provincial operations in different parts of the country, despite the fact that such operations all come under the authority of the MVTA. This situation resulted in discussions of industry deregulation at a national level. Between 1994 and 1996, a federal-provincial-industry task force sought consensus on the future of bus regulation in Canada, but was unable to agree whether to

ne

deregulate scheduled intercity service.

The federal government has proposed to amend the MVTA as part of the national implementation of a motor carrier safety performance regime based on the standards of the National Safety Code for Motor Carriers. The safety aspects of the proposed amendments are discussed in the trucking section of this chapter as the MVTA safety regime would apply to extra-provincial bus operators, as well as extra-provincial truckers.

Transport Canada has also proposed that the MVTA amendments be used to co-ordinate national bus regulation for extra-provincial carriers, and to re-establish consistency in the regime for extra-provincial operators. In addition, the department has proposed to use the amendments to deregulate the interprovincial and international bus operations of extra-provincial carriers, while allowing each province to decide how it wants to regulate the intraprovincial operations of these carriers for an additional period. Transport Canada expects to proceed with these amendments in 1999.

#### **Industry Events**

In June 1998, Laidlaw Inc. became a minority shareholder in Penetang Midland Coach Lines Ltd., an Ontario-based provider of scheduled, charter, urban transit and school bus services. In December 1998, Greyhound Canada Transportation Corporation, a subsidiary of Laidlaw, purchased Voyageur Colonial, an Ottawa-based scheduled intercity and charter operator.

# TABLE 13-9 REGULATORY STATUS OF EXTRA-PROVINCIAL BUS OPERATORS BY PROVINCE

BY PROVINCE			
Province	Current Status		
Newfoundland.	Deregulated, except for scheduled service on th Trans-Canada Highway		
Prince Edward Island	Completely deregulated		
Nova Scotia	Regulated		
New Brunswick	Modified regulation (reverse onus entry test*)		
Quebec	Regulated		
Ontario	Relaxed economic regulation		
Manitoba	Regulated		
Saskatchewan	Regulated		
Alberta	Streamlined economic regulation of scheduled service		
British Columbia	Regulated		
Northwest Territories	Completely deregulated		
Yukon	Modified regulation (reverse onus entry test)		

\* A test whereby the objector must demonstrate that issuing a licence would be detrimental to the public

Source: Transport Canada

# TABLE 13-10 LARGEST SCHEDULED INTERCITY CARRIERS BY NUMBER OF COACHES

Province	Number of Coaches
Alberta	353
Alberta	300
Ontario	108
Ontario	151
Ontario	135
Quebec	74
New Brunswick	71
British Columbia	66
Quebec	60
Manitoba	60
	Alberta Alberta Ontario Ontario Ontario Quebec New Brunswick British Columbia Quebec

1 Pacific Western Transportation Inc. has operations in Ontario and British Columbia.

Source: Bus Industry Directory, 1999; Motor Coach Canada Presentation - Aug. 98

In addition, Laidlaw placed a bid to purchase Greyhound Lines Inc. of Dallas, Texas, a company without any ties to Greyhound Canada. While Greyhound Lines Inc. has a very limited presence in Canada, this proposed purchase, if finalized, would make Laidlaw Inc. the largest scheduled intercity bus company in North America.

#### **BUS SERVICES**

#### **Scheduled Intercity Operators**

Intercity bus services are the smallest segment of the industry, but provide the bulk of long-distance bus transportation. They are sub-divided into two groups — scheduled intercity operators and charter operators — with the latter also operating tour and

Provinc

British

Alberta

SCHEDULED INTERCITY CARRIERS BY PROVINCE 1998			
	Number of	Number of	
ce	Carriers	Coaches	
Columbia	10	151	
1	6	729	
tchewan	2	41	
ba	1	60	
	14	628	
	4.4	100	

**TABLE 13-11** 

Saskatchewan	2	41
Manitoba	1	60
Ontario ·	14	628
Quebec	11	182
New Brunswick	1	71
Nova Scotia	4	35
Prince Edward Island	n/a	n/a
Newfoundland	3	22
Northwest Territories	1	4
Yukon	3	10
Canada	56	1,933
Source: Bus Industry Directory, 1999		

TABLE 13-12 CHARTER BUS COMPANIES BY PROVINCE 1998			
Province	Number of Carriers	Number of Coaches	
British Columbia	35	724	
Alberta	30	352	
Saskatchewan	6	54	
Manitoba	3	52	
Ontario	34	342	
Quebec	25	261	
New Brunswick	4	48	
Nova Scotia	4	2	
Prince Edward Island	1	0	
Newfoundland	2	12	
Northwest Territories	3	10	
Yukon	2	1	
Canada Source: Bus Industry Directory, 1999	149	1,858	

airport services. Most of the larger operators in these two groups provide a combination of both intercity and charter services.

Table 13-10 lists the 10 largest scheduled intercity carriers ranked by the number of coaches in operation. Three of the top 10 operators are owned by Laidlaw Inc., which operates

approximately 520 coaches through its subsidiary companies.

Table 13-11 shows the number of scheduled intercity carriers by province in 1998. The large number of coaches based in Alberta is due to the presence of the Greyhound and Pacific Western Transportation bus lines. The number of coaches does not include school or transit

buses, or other smaller vehicles used by these operators in their day-to-day operations.

There is no national scheduled intercity bus carrier in Canada; however, scheduled intercity bus services allow passengers to travel from coast to coast by interlining. Most operating authorities give carriers exclusive rights to individual bus routes. Carriers that operate regularly across provincial boundaries (extra-provincial) come under federal jurisdiction. This includes all major intercity and charter operators. However, the federal government does not actually regulate the operation of extra-provincial bus companies, having allowed the provinces to do so under the authority of the Motor Vehicle Transport Act, 1987 (MVTA). Most school and urban transit operators in Canada fall under provincial jurisdiction.

#### **Charter Operators**

Charter services are generally characterized by a group trip where all passengers embark and disembark at the same point. Generally, charter operators are granted the right to operate trips out of a given location or city and are allowed open-ended access to destinations. Operators have the flexibility to offer a broad spectrum of services ranging from a half-day school trip to a three-week excursion. They can also offer return or one-way trips. Local sightseeing tours are also considered a form of charter service.

In 1996, 103 charter operators with annual revenues exceeding \$200,000, reported to Statistics Canada total annual operating revenues of \$270 million and operating expenses of \$261 million. Data on the number of passengers carried is not collected; however,

3,300 vehicles travelled a total of 157 million kilometres in 1996.

Table 13-12 shows the number of charter bus companies by province in 1998. British Columbia, Alberta, Ontario and Quebec account for almost 85 per cent of the total number of carriers. It is important to note that this list of carriers includes only those responding to the survey conducted for the Bus Industry Directory. In addition, as was the case for scheduled intercity operators, the number of coaches does not include school buses, transit buses or other smaller vehicles used in daily operations.

Table 13-13 lists the largest charter bus companies by number of coaches in operation in 1998. More than half of these carriers are based in British Columbia.

#### **Urban Transit**

All major Canadian cities have some form of urban transit service. In terms of revenue, urban transit is the largest component of Canada's bus industry. This type of service, however, is typically subsidized by both municipal and provincial governments. Some transit operators also offer school bus and charter services, as well as service for the elderly and disabled.

## MARINE TRANSPORTATION INDUSTRY

Canada's marine industry includes a domestic fleet of operators providing domestic and transborder shipping services, as well as an international marine trade calling at major ports for import and export traffic overseas. The year was marked by a number of important events and some significant legislative changes.

### TABLE 13-13 LARGEST CHARTER BUS COMPANIES BY NUMBER OF COACHES 1998

Carrier	Province	Number of Coaches
Autocar Connaisseur Inc	Quebec	112
Kunkel Bus Lines	Ontario	102
Gray Line of Victoria (Laidlaw)	British Columbia	100
Brewster Transportation &Tours	Alberta	86
Autocars La Capitale Inc	Quebec	75
Charter Bus Lines of BC	British Columbia	69
Vancouver Island Coach Lines (Laidlaw)	British Columbia	66
Canamera Tours Ltd. (Int'l Coach tours)	British Columbia	65
International Stage Lines	British Columbia	60
Source: Bus Industry Directory, 1999		

# MAJOR MARINE EVENTS IN 1998

## Legislative and Regulatory Changes

#### Canada Marine Act (Bill C-9)

The Canada Marine Act
(Bill C-9) received Third Reading
in the Senate on May 28, 1998, and
Royal Assent was signed on
June 11, 1998. The main objective
of the legislation is to ensure the
Canadian ports system is
competitive, efficient,
commercially oriented and locally
responsive by establishing Canada
Port Authorities at 18 of Canada's
major ports and divesting certain
harbours and ports.

Part III of the Act establishes a new framework for the management of the St. Lawrence Seaway. Other sections of the Act provide for amendments to the *Pilotage Act*. The sections of the Act dealing with pilotage and the Seaway came into force during 1998, while the sections relating to the establishment of Canada Port Authorities will be implemented in 1999.

### Amendments to the Canada Shipping Act (Bill S-4)

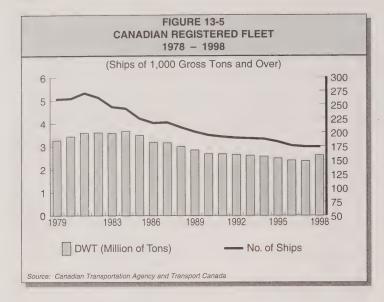
Bill S-4, An Act to amend the Canada Shipping Act, was introduced in the Senate in October 1997, and in the House of Commons on February 11, 1998. It received Royal Assent on May 12, 1998.

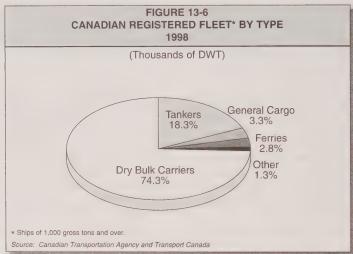
The new legislation implemented the provisions of the 1976 Convention on Limitation of Liability for Maritime Claims and its 1996 Protocols, which increase the amount of compensation available to private and public claimants for all maritime claims, with the notable exception of claims for oil pollution damage. These provisions came into force on August 10, 1998.

The remaining provisions, which relate to claims for oil pollution damage, will come into force on May 29, 1999, 12 months from the date on which Canada deposited its instrument of accession to the 1992 Protocols with the International Maritime Organization.

## 1998 Developments in Liner Shipping

In October 1998, the United States passed the *Ocean Shipping Reform Act* of 1998 to replace the





existing *Shipping Act* of 1984. The new Act will take effect on May 1, 1999. The Act includes several significant changes: an end to tariff filing with the Federal Maritime Commission (to be replaced by publicly available tariff information offered through automated electronic means, such as the Internet); the introduction of confidential service contracts

between individual conference lines and shippers (only essential terms,<sup>5</sup> will be publicly available); a reduction of the notification period before Independent Action can be taken; and a decision that states conferences will only be able to set voluntary guidelines for confidential service contract negotiations by member lines.

In September 1998, the European Commission issued its ruling on the Trans-Atlantic Conference Agreement. In its interpretation of European Council regulations governing competition rules on maritime transport and joint inland rate-setting activities, the EC found that the Agreement was in violation of EC regulations by engaging in joint inland (intermodal) rate setting, joint service contracts, and joint setting of freight forwarders' commissions. TACA members, who were fined as a result of the decision, are appealing. Despite this, the EC decision clarified how the regulation governing liner shipping conferences is to be applied and resulted in changes to conference operations.

#### **Industry Events**

In 1998, there were many important changes in the marine sector. Among the most notable:

- Canadian Pacific Ltd.
   (CP Ships) acquired South
   American operator Ivaran Lines,
   and purchased, subject to
   regulatory approval, Australia
   New Zealand Direct Line.
- Gearbulk Holdings bought the Canadian Transport Co. Ltd., a British Columbia-based forest products company, from Northern Navigation International. This purchase came just 18 months after Northern Navigation bought Canadian Transport from MacMillan Bloedel, a Canadian forest company.
- The Washington Marine Group announced that its subsidiary, Seaspan Coastal Intermodal Company, purchased the assets of Canadian Pacific Railways' west coast marine transportation business, Coastal Marine Operations. The company

<sup>5</sup> Essential terms include origin and destination port ranges; commodity or commodities involved; minimum volume or portion; and duration of the contract.

carries trailers and containers, as well as railcars between the British Columbia mainland and Vancouver Island.

- The management of St.
  Lawrence Seaway operations
  was transferred to the St.
  Lawrence Seaway Management
  Corporation on October 1, 1998,
  from the St. Lawrence Seaway
  Authority. A new Crown
  corporation, the Federal Bridge
  Corporation Ltd., was created to
  manage the major bridges not
  related to navigation, which
  were formerly the responsibility
  of the St. Lawrence Seaway
  Authority.
- Maersk Inc. and Sea-Land Services Inc. short-listed the Port of Halifax as a possible site for the location of their new super terminal, which will handle post-panamax container vessels.
- Bay Ferries Ltd. introduced a high-speed catamaran service on its Yarmouth–Bar Harbor ferry route.
- On the west coast, BC Ferries carried out sea trials on the first of its new high-speed catamarans.

# MARINE FREIGHT TRANSPORT SERVICES

#### **Domestic Services**

Figure 13-5 shows the number of Canadian-registered merchant fleet vessels as of December 1998. The preliminary data indicate the Canadian-registered merchant fleet consisted of 174 self-propelled vessels (more than 1,000 gross tonnage) with a total dead-weight tonnage of 2.6 million tonnes.

These figures represent an increase of 10 per cent in terms of deadweight tonnage over 1997. Dry bulk carriers are the backbone

# TABLE 13-14 EAST COAST CANADIAN-FLAG CARGO FLEET 1,000 GRT AND OVER, 1998

1,00	JU GHT ANL	OVE	n, 1990	)			
Companies	Type N	/essel lumber		Area of Operation			
Algoma Central Corporation	Bulker Self-Unloader Tanker Total:	10 14 5 <b>29</b>	263,720	Great Lakes/St. Lawrence Great Lakes/St. Lawrence Great Lakes/St. Lawrence			
Black Creek Shipping Co. Ltd.	Self-Unloader <b>Total:</b>	1	10,532 <b>10,532</b>	Great Lakes/St. Lawrence			
C.A. Crosbie	Other Total:	2 <b>2</b>	5,700 <b>5,700</b>	Maritimes			
Canada Steamship Lines Inc.	Self-Unloader		235,813	Great Lakes/St. Lawrence /Maritimes			
	Total:	11	235,813				
Canarctic Shipping Ltd.	Bulker	1	25,418	Canadian Arctic from May to November			
	Total:	1	25,418				
Canship Ltd.	Tanker Total:	2 <b>2</b>	248,700 <b>248,700</b>	Maritimes			
EnerChem	Tanker	3	16,003	Great Lakes/St. Lawrence / Maritimes			
	Total:	3	16,003				
Groupe Desgagnés	Bulker	3	23,276	St. Lawrence/Great Lakes /Arctic			
	Tanker	2		Great Lakes/St. Lawrence / Maritimes			
	Other	3	,	St. Lawrence/Great Lakes / Arctic			
	Total:	8	44,168				
Imperial Oil	Tanker Total:	3 <b>3</b>	29,056 <b>29,056</b>	Great Lakes			
Irving / Kent Line	Tanker Total:	3 <b>3</b>	51,141 <b>51,141</b>	Maritimes			
N.M. Paterson & Sons	Bulker Total:	7 <b>7</b>	113,814 <b>113,814</b>	Great Lakes/St. Lawrence			
Oceanex	Other Total:	3 <b>3</b>	49,182 <b>49,182</b>	Maritimes			
P & H Shipping	Bulker Total:	2 <b>2</b>	32,570 <b>32,570</b>	Great Lakes/St. Lawrence			
Shell	Tanker Total:	1	2,758 <b>2,758</b>	St. Lawrence			
Secunda Marine Services	Other Total:	6 <b>6</b>	7,466 <b>7,466</b>	Maritimes			
Transport Nanuk	Other	2	17,396	Great Lakes/St. Lawrence / Maritimes			
	Total:	2	17,396				
Upper Lakes Group	Bulker Self-Unloader Total:	14 7 <b>21</b>	,	Great Lakes/St. Lawrence Great Lakes/St. Lawrence			
TOTAL:			,784,363				
Source: Fairplay World Shipping Directory 1998 - 1999 and Transport Canada data.							

TABLE 13-15
WEST COAST CANADIAN-FLAG CARGO FLEET
1,000 GRT AND OVER, 1998

Companies	Type	Vessel Number	GRT	Area of Operation
Companies	Tug	29		West Coast of
Seaspan International	Tug	29	7,271	North America
	Barge	11	51,851	
	Total:	40	59,122	
Rivtow Marine Ltd.	Tug	12	3,519	West Coast of British Columbia
	Barge	1	9,043	
	Total:	13	12,562	
Kingcome Navigation	Tug	2		Pacific Coast
Company	Barge	3	20,192	
	Total:	5	20,575	
Pacific Towing Services	Tug	5	,	Pacific Northwest Coast
	Total:	5	1,362	0
The JJM Group  C.H. Cates & Sons Ltd.	Tug Total:	3 <b>3</b>	403 <b>403</b>	Coastal British Columbia
		_		D-1-(1)/
	Tug Total:	3 <b>3</b>	376 <b>376</b>	Port of Vancouver
Blue Band Navigation				Onestal British Oslambia
	Tug Total:	2 <b>2</b>	697 <b>697</b>	Coastal British Columbia
Lafavea Camaturation		2		British Columbia /
Lafarge Construction Materials (Marine Division)	Tug	2	213	Washington
	Total:	2	273	**aomington
Island-Sea Marine Ltd.	Tug	1	271	West Coast of
	3			North America
	Total:	1	271	
Minette Bay Ship Docking Ltd.	Tug	1	125	West Coast of British Columbia
	Total:	1	125	
TOTAL:		75	95,766	
Comment of the state of China and China	1007 1000 11-	n Object		h 1000

Source: Lloyd's List of Shipowners 1997-1998, Harbour & Shipping, December 1998 and Transport Canada data.

of this fleet, with 41 per cent of total vessels and 74 per cent of total deadweight carrying capacity. Liquid bulk carriers ranked second with 18 percent of total carrying capacity up from ten per cent in 1997.

The Canadian Transportation Agency estimated that the Canadian fleet of tugs and barges (100 gross tons and over) in 1998 included 239 tugs and offshore supply ships (90,227 GRT) and 1,291 barges, and other non self-propelled vessels (1.16 GRT).

#### Eastern Canada

Table 13-14 provides information on vessel type, gross registered tonnage (GRT), and area of operation, of companies operating Canadian-flag vessels of 1,000 GRT or above in Eastern Canada. Algoma Central Corporation and Upper Lakes Group are the two largest operators in the area. Algoma Central Corporation, with 27 per cent of eastern Canada's fleet capacity, is the largest inland shipping company in Canada.

Traditionally, Algoma Central operated in the dry bulk trades; however, in 1998, it bought five tankers from Imperial Oil Ltd., the Canadian subsidiary of Exxon Corp. Upper Lakes Group, with 23 per cent of the fleet capacity in eastern Canada, is also one of the country's largest shipping companies. Its cargoes consist mainly of grain, iron ore, coal, salt, cement and gypsum.

The largest portion of eastern Canada's domestic cargo fleet operates on the Great Lakes—St. Lawrence Seaway system. In 1998, the eastern Canadian cargo fleet included 30 straight-deck bulkers, 33 self-unloader bulkers, 26 tankers and 16 other vessels.

From 1989 to 1998, the number of straight-deck bulkers decreased from 48 to 30 vessels, a 38 per cent drop. This was the result of various factors, including ships being operated under another flag (flagged out), sold to foreign interests or for scrap, and converted to self-unloaders. Algoma Central Corporation and Upper Lakes Group control 24 of the straight-deck bulkers through a pooling agreement and operate under the name Seaway Bulk Carriers. Straight-deck bulkers mainly carried grain downbound to St. Lawrence ports and iron ore as backhaul cargo for upbound destinations.

The fleet of self-unloader bulkers remained relatively stable between 1989 and 1998, with vessels that were flagged out or scrapped balanced by new entries, primarily conversions from straight-deck bulk vessels. In 1998, Algoma Central Marine and Upper Lakes Shipping operated 21 self-unloaders through a pooling agreement (Seaway Self-Unloaders), while Canada Steamship Lines Inc. operated

11 vessels in the fleet and Black Creek Shipping Company Ltd. operated the remaining vessel. Self-unloader bulkers serve a more diversified market than straightdeck bulkers, moving coal, iron ore, stone, salt, gypsum and other cargoes.

Other vessels operating in Eastern Canada include 26 tankers, owned by Algoma Central Corporation, Canship Ltd., EnerChem Transport Inc., Groupe Desgagnés, Imperial Oil, Irving and Shell; and 16 general cargo and other vessels, owned by C.A. Crosbie, Groupe Desgagnés, Oceanex, Secunda Marine Services and Transport Nanuk.

In addition to the cargo fleet, a significant fleet of ferry vessels operates on the Atlantic coast. At the end of 1998 the fleet included 12 ferries.

#### Western Canada

There is a significant tug and barge fleet on the west coast as well as an important fleet of ferry vessels. Most of the tug and barge fleet operate in domestic trade, but some also trade internationally between Canadian and US ports.

Table 13-15 shows the top ten tug and barge operators (operating vessels of 100 GRT and over) on Canada's west coast. Together these ten firms account for 70 per cent of the West Coast fleet of tugs and 13 per cent of the fleet of barges (in terms of GRT). Three of the top ten companies are owned by Montana businessman Dennis Washington. They include Seaspan International Ltd., with a total fleet capacity of 59,122 GRT; C.H. Cates & Sons Ltd., with 376 GRT; and Kingcome Navigation Company, with 20,575 GRT. These companies account for 84 per cent of the top ten operators' fleet capacities. Seaspan International Ltd. is

Canada's largest tug and barge operator. Serving primarily the west coast of North America, Seaspan's main areas of business include tug and barge transportation, log barging and ship docking.

#### Northern Canada

The Northern Transportation Co. Ltd. is the major operator in Northern Canada, which encompasses the Mackenzie River and the Arctic Ocean. In 1998, the company owned 81 vessels, including 72 oil barges and 9 tugs, for a total capacity of 72,877 GRT. The average age of the fleet is approximately 27 years.

#### **International Services**

#### **Bulk Shipping**

For international marine services, Canadian shippers' needs delimit the type of services they use. For bulk commodities, such as grain, coal, iron ore and potash, shippers use bulk shipping operators.

Bulk shipping freight rates are normally set in the global open market, which is highly competitive. The market is generally divided between time charters (term contracts) and the spot market. The terms of charter contracts typically range from one to five years, depending on the volatility of prices. Longer contracts usually prevail during periods of greater predictability in transportation rates, while shorter contracts are more common when prices are unstable. Most of Canada's exports and imports are moved under these types of marine service arrangements. The spot or "tramp" market is made up of short-term contracts covering a specific number of voyages, days or given quantity of cargo. Spot prices are set in open markets and exchanges. Price levels depend on supply and demand factors such as

vessel size, equipment, trade route and timeliness of the service requirement.

#### Liner Shipping

Liner services are offered according to published schedules and on specific trade routes with fixed itineraries. Liner carriers generally handle containerized and/or break-bulk cargoes, such as electronics, manufactured goods or frozen produce.

The international liner trade is dominated by large fleets of specialized container vessels operating on major trade routes around the world. A large proportion of the world fleet is controlled by Pacific Rim and Western European interests. Canada controls a relatively small fleet in comparison with these major players; however, this presence has been widening through the acquisition of lines.

Shipping lines calling at Canadian ports may provide conference liner and nonconference liner services. Ocean carriers providing liner services on a common trade route often elect to form a conference and collectively agree on rates and/or conditions of service. Shipping lines that do not operate within a shipping conference are referred to as "independents" or "nonconference operators," and may also provide liner services.Contrary to conference carriers, non-conference lines are not required to file a tariff with the Canadian Transportation Agency. Today, non-conference liner carriers often offer services that are fully comparable to conference operators in terms of level of service. In recent years, roughly half of Canada's liner trade travelled on non-conference lines.

## TABLE 13-16 SHIPPING CONFERENCES SERVING CANADA IN 1998

American West African Freight Conference (E) Australia/Canada Container Line Association (E & W) Canada/Australia-New Zealand Association of Carriers (E & W) Canada/Australia-New Zealand Discussion Agreement (E) Canada Caribbean Shipowners Association (E) Canada Transpacific Stabilization Agreement (E & W) Canada - United Kingdom Freight Conference (E) Canada Westbound Rate Agreement (E & W) Canadian Common Tariff Conference (E) Canadian Continental Eastbound Freight Conference (E) Canadian North Atlantic Westbound Freight Conference (E) Continental Canadian Westbound Freight Conference (E) East Canada - South America Rate Agreement (E) Japan - East Canada Freight Conference (E) Japan - West Canada Freight Conference (W) Mediterranean Canadian Freight Conference (E) Mediterranean North Pacific Coast Freight Conference (W) New Zealand/Canada Container Line Association (E & W) The "8900 Lines" Rate Agreement (E)

E = East Coast; W = West Coast.

Source: Canadian Transportation Agency

Lines that are conference members on one route are not necessarily members on all of the routes or points served. Also, where a conference agreement applies only to Canadian cargo, shipping lines that solicit cargo from US-based shippers (such as North Atlantic operators calling at Montreal) could carry nonconference cargo on the same vessels that operate in the conference service.

## Services Available to Canadian Shippers

Table 13-16 lists the 19 tarifffiling shipping conferences serving Canada in 1998. Seventeen serve the east coast and seven the west coast. During 1998, the Canada/Australia-New Zealand Discussion Agreement started filing as a conference.

Shippers benefit not only from competition between conference and non-conference carriers, but also from competition within conferences through the independent action provision contained in the Shipping Conferences Exemption Act, 1987. This provision permits individual conference lines to offer a rate or services different from that which is published as part of the conference tariff. Further, shipping conference rates paid by shippers can be negotiated and signed as a confidential "service contract" between a conference and a shipper. Service contracts must be filed with the Canadian Transportation Agency to comply with the Act.

In 1998, the Agency accepted filings for 163 service contracts from seven shipping conferences. These contracts apply to both

inbound and outbound traffic and to origins/destinations on both the east and west coasts of Canada. The 163 contracts filed is comparable to filings in recent years: 181 in 1997; 140 in 1996; and 175 in 1995.

Recent trends in the world of international liner shipping continued through 1998: mergers and acquisitions of shipping lines, construction and delivery of postpanamax6 size ships (ships too large to pass through the Panama Canal), and depressed freight rates on many international trade routes. In some cases, overall freight rates between Canada and northern Europe were frozen for the coming vear at 1998 levels. Weakened Asian currencies, depressed exports to Asia, and falling bunker fuel costs have generally prevented freight rates from rising in trade lanes between Canada and Asia.

CP Ships continued to strengthen its position as a major player in the global container shipping business. During 1998, it acquired the South American operator Ivaran Lines, announced a joint venture with Transportation Maritima Mexicana, and purchased, subject to regulatory approval, Australia New Zealand Direct Line. As a result, CP Ships is expanding its trade lanes beyond its traditional North Atlantic routes into Central and South America and to Australia and New Zealand.

Other examples of mergers and acquisitions in 1998 include the P&O Nedlloyd Ltd. acquisition of Blue Star Line Ltd. (completed April 1998), the Evergreen purchase of Lloyd Triestino, and the Hamburg-Sud acquisitions of South Seas Shipping Co. and Alianca Lines.

<sup>6</sup> Post-panamax container vessels generally include vessels of 5000 or more Twenty-foot Equivalent Units. Thirty of these ships were ordered in 1998.

### MARINE PASSENGER TRANSPORT SERVICES

#### **Ferry Services**

Canada's ferry services vary widely in terms of ownership (from small private operators to provincial governments and federal Crown corporations), vessel types (small cable ferries to large cruise-type vessels and fast ferries) and operations (seasonal to year-round schedules). Terminal and docking facilities are variously owned, leased and operated by ferry companies, municipalities, provincial and federal governments or other private companies.

The Canadian Ferry Operators Association (CFOA) counts among its membership all the major ferry operators in Canada. Collectively, these operators employ approximately 7,650 persons.

#### **Cruise Ship Industry**

The cruise industry is recognized as a growth sector by many levels of government in Canada. The federal government has encouraged cruise activity in the Great Lakes-St. Lawrence Seaway system through changes to regulations governing casino operations on board cruise ships in Canadian waters. The Atlantic Canada Opportunities Agency has also contributed financially to an Atlantic Canada Cruise Association initiative to market Atlantic Canada ports as destinations for international cruise vessels over the next three years.

Foreign-based companies provide the vast majority of extended cruise operations that call at Canada's east and west coast ports. There are two basic categories of extended cruises -

#### FEDERAL ROLE IN FERRY SERVICES

In accordance with the National Marine Policy announced in December 1995, the federal government is looking at ways to reduce costs and increase efficiency through new vessel management and procurement practices, commercial operation of vessels and the streamlining of ferry services. The commercialization initiatives are consistent with the government's objective to make Canada's transportation system responsive to future commercial challenges by reducing its involvement in the direct delivery of transportation services and allowing the private sector to provide some of these services.

The federal government continues to focus on the safety and security of ferry services through regulation. In addition, the federal government continues to subsidize constitutionally guaranteed ferry services and services to remote communities. Federally supported ferry services in Atlantic Canada are limited to those provided by Marine Atlantic Inc., a federal Crown corporation, and by three private-sector operators -Northumberland Ferries Limited, Bay Ferries Limited, and C.T.M.A. Traversier Itée. Federally subsidized ferry services in Western Canada, in the form of a grant, will continue to be provided to the Province of British Columbia.

the luxury cruise and the pocket cruise, distinguished by vessel capacity of more or less than 150 passengers.

Most luxury cruise vessels sailing to Alaska use the Port of Vancouver as their home port (where passengers embark and/or disembark). Alaska has become the third largest cruise market in the world, after the Caribbean and Europe. Vancouver has benefited from the provisions of the US Passenger Vessel Act, which prohibits foreign-flag vessels from carrying passengers between US ports (i.e. embarking passengers at one US port and disembarking them at another). Trips between Vancouver and Alaska also fit conveniently into a seven-day time frame.

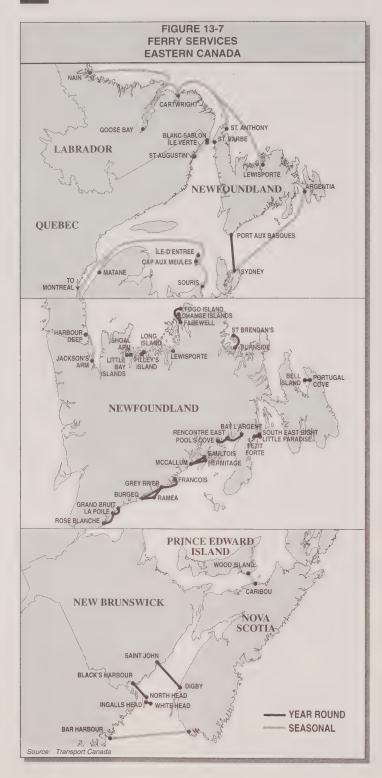
In eastern Canada, luxury cruise ships regularly travel along the eastern seaboard and up the St. Lawrence River to Québec City and Montreal. They also sail out of New York, northward to Halifax, Saint John and other Atlantic ports. Many of these cruises have

traditionally been scheduled for the fall colour season, but summer visits are becoming increasingly popular as well. Pocket cruises travel the St. Lawrence River between Montreal or Quebec City, and Kingston or Rochester, as well as along the Erie Canal and Hudson River to Warren, New York.

The 420-passenger luxury cruise ship, M/S Columbus, was back in the Great Lakes for a second season in 1998. Its arrival in 1997 marked the first visit by a luxury cruise vessel to the Great Lakes in over two decades.

#### CANADA SHIPPING ACT

Under the Canada Shipping Act, passenger vessels with a capacity of more than 12 passengers or over five gross tonnes must obtain a Certificate of Inspection to operate, and are submitted to regular Coast Guard inspections.



Local Canadian operators also offer a multitude of lock, harbour and river cruises, as well as excursions such as those for whale watching.

According to Canadian
Passenger Vessel Association,
there are at least 160 companies
across Canada that operate
inspected vessels in the passengercarrying tourism business.

#### **Federal Subsidies**

Under the National Marine
Policy, the federal government has
concluded numerous
commercialization initiatives that
transfer responsibility for ferry
services to provincial authorities
or the private sector. These
initiatives ensure that ferry
services are delivered as
cost-effectively as possible.

On April 1, 1997, the Province of Newfoundland assumed responsibility for ferry services to Labrador in exchange for a one-time grant of \$340 million.

In 1997, the federal government also privatized Marine Atlantic's Yarmouth, Nova Scotia-Bar Harbor, Maine, and Saint John, New Brunswick-Digby, Nova Scotia ferries. The new operator. Bay Ferries Limited, will receive a subsidy for the first three years of a five-year contract, after which the operator will continue to provide service with no further federal assistance. After two years of operation, Bay Ferries has increased ridership and is reporting a profit. In 1998, the company acquired and introduced a high-speed catamaran for the Yarmouth-Bar Harbor service.

Marine Atlantic has been undergoing a major transformation, divesting four of its six ferry services. Employee severance and restructuring costs

#### **OVERVIEW OF MAJOR FERRY SERVICES AND CHANGES**

Marine Atlantic Inc. (MAI), a federal Crown corporation, operates the constitutionally guaranteed year-round ferry link between North Sydney, Nova Scotia, and Port aux Basques, Newfoundland, and the seasonal alternative between North Sydney, Nova Scotia, and Argentia, Newfoundland. In 1998, Marine Atlantic relocated its corporate headquarters from Moncton, New Brunswick, to North Sydney, Nova Scotia, and Port aux Basques, Newfoundland.

Coastal Transport Limited operates the year-round passenger/vehicle ferry service to the islands of Grand Manan and White Head, New Brunswick, under contract with the Province of New Brunswick. The ferry to Grand Manan leaves daily from Black's Harbour, New Brunswick, while White Head Island ferry departs several times a day from Grand Manan at Ingalls Head.

Northern Cruiser Ltd. (NCL) operates a single passenger/vehicle ferry service between Blanc Sablon, Quebec, and St. Barbe, Newfoundland, from May to January, under contract with the Province of Newfoundland.

**Northumberland Ferries Limited (NFL)** provides seasonal passenger/vehicle ferry transportation (May 1 to December 20) between Caribou, Nova Scotia, and Wood Islands, Prince Edward Island, under contract with the federal government.

**Bay Ferries Limited** provides yearly passenger and vehicle ferry service between Saint John, New Brunswick, and Digby, Nova Scotia, and seasonal service (June 1 to mid-October) between Yarmouth, Nova Scotia, and Bar Harbor, Maine, under contract with the federal government.

C.T.M.A. Traversier Ltée provides federally subsidized passenger/vehicle ferry service between Cap-aux-Meules, Magdalen Islands, Quebec, and Souris, Prince Edward Island, during the ice-free period from early April until late January. C.T.M.A. also provides a passenger/cargo ferry service from Cap-aux-Meules to Montreal from April to December and from Cap-aux-Meules to Matane during the winter, under contract with the Province of Quebec.

**Newfoundland and Labrador's Department of Works, Services and Transportation** provides all of the intraprovincial and coastal ferry services under contract with private operators.

Quebec's transportation ministry subsidizes la Société des traversiers du Québec (STQ), which operates five year-round passenger/vehicle ferry services across the St. Lawrence River within the Province of Quebec. STQ also has responsibility for three other provincially subsidized ferry services, which are operated by private companies. These routes include Rivière-du-Loup to Saint-Siméon (operated by CFOA member La Traverse Rivière-du-Loup/Saint-Siméon Ltée), Montmagny to Île-aux-Grues, and Cap-aux-Meules to Île-d'Entrée.

In addition to subsidizing STQ and the three private companies under STQ's responsibility, the **Quebec Ministry of Transportation** also subsidizes a fourth private operator servicing Isle Verte and a water taxi service in St. Augustin. The Ministry is also responsible for the adjudication of contracts for transporting supplies to native communities in Northern Quebec.

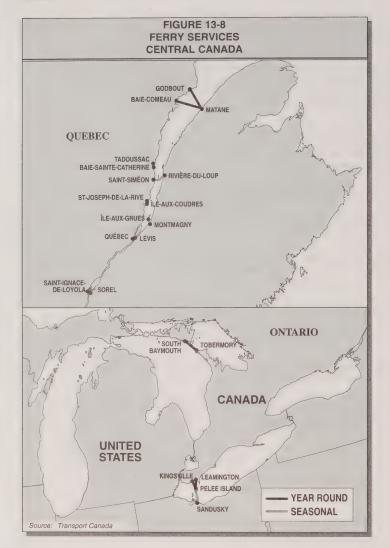
The **Ontario Ministry of Transportation** provides financial support to five year-round ferry operations in eastern Ontario. The Province of Ontario operates the Glenora, and the Wolfe Island to Kingston ferries, while ferry services to Amherst, Howe and Simcoe islands are operated by their respective township authorities.

The **Owen Sound Transportation Company (OSTC)** provides seasonal passenger/vehicle ferry services on Lake Huron between Tobermory, Ontario, and South Baymouth, on Manitoulin Island, from early May until mid-October. OSTC also manages transportation services on Lake Erie between Leamington/Kingsville and Pelee Island, Ontario, and Sandusky, Ohio, from April through December on behalf of the Ontario Ministry of Transportation.

The Manitoba Department of Highways and Transportation operates seven passenger/ vehicle ferries, three motor vessels and four cable ferries.

The British Columbia government receives a federal grant for the provision of ferry services in coastal waters. **British Columbia Ferry Corporation (BC Ferries)**, a provincial Crown corporation, is the largest ferry operation in North America, with a fleet of 40 vessels on 24 routes serving 42 ports.

British Columbia's **Ministry of Transportation and Highways** is responsible for the operation and maintenance of British Columbia's inland ferry service, and contracts with a private operator for the provision of a tug and barge ferry service. The Ministry also subsidizes a **private ferry service** on one of the province's interior lakes.



had a significant impact on its financial requirements in 1997/98 and will continue to be a draw on government funding in future years. Forecasts place operational subsidies at an average of \$27.5 million from 2000 to 2003, limiting them to the amount required for the North Sydney–Newfoundland ferry services.

As a result of the 1997 acquisition of the *MV Madeleine*, C.T.M.A. Traversier Ltée operating subsidy requirement will be temporarily higher due to start-up costs. The subsidy is expected to level off at approximately \$2.6 million in the near future.

In April 1998, the federal government extended the subsidy operating agreement with Northumberland Ferries Limited (NFL) to March 31, 2003, to eliminate any uncertainty about the government's commitment to this service. The extension will also provide NFL with a five-year planning horizon, allowing the company to invest in its human resources and make strategic business decisions.

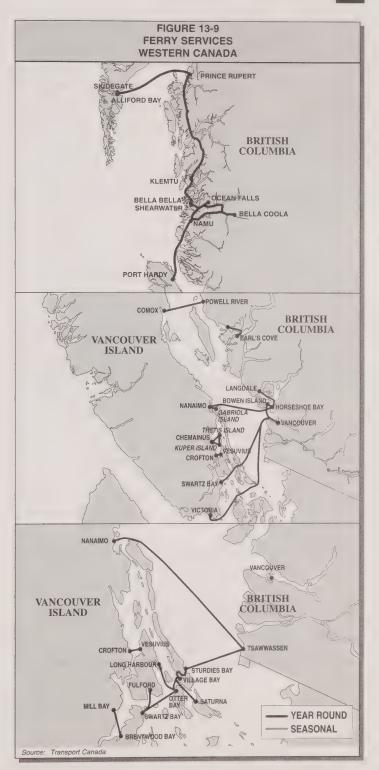
Transport Canada remains committed to managing the remaining subsidized ferry services as efficiently as possible, and to responding to changing operating conditions to make the best use of equipment and minimize costs.

### AIR TRANSPORTATION INDUSTRY

### Major Aviation Events in 1998

### **Industry Changes**

During 1998, there were a number of changes in the airline industry. Inter-Canadien was acquired from Canadian Regional Airlines by Quebec-based Canadian Investors Corporation. Air Atlantic, a commercial partner of Canadian Airlines owned by the IMP Group that served Atlantic Canada, ceased to operate. The services of Canadian North were assumed by Air NorTerra of NorTerra Inc., an investment holding company of the Inuvialuit Development Corporation of the western Arctic and the Nunasi corporation of the Eastern Arctic which acquired Canadian North from its parent, Canadian Airlines.



#### **TABLE 13-17 GLOBAL AIRLINE ALLIANCES** 1998 STAR oneworld Winas KLM Royal Dutch Airlines Canadian Airlines Air Canada American Airlines Northwest Airlines United Airlines British Airways Alitalia Lufthansa Continental Airlines Thai Airways International Qantas VARIG Cathay Pacific Kenva Airwavs Braathens SAS Scandanavian Air System Associated: Associated: Associated: Air China Singapore Airlines Japan Airlines All Nippon Airways Asiana Airlines Japan Air System **Ansett Airlines EVA Airways** Malaysia Airlines Air New Zealand Pakistan International China Eastern Airlines China Airlines China Southern Airlines Ansett New Zealand Mandarin Airlines Air Niugini Korean Air Air Pacific Phillipine Airlines Mexicana

AIRCRAFT OF SELECTED CANADIAN CARRIERS IN PASSENGER SERVICES							
	Wide- bodied	Narrow- bodied	Propeller driven	Total			
Air Canada	46	109	-	155			
AC Affiliates <sup>1</sup>	-	10	67	77			
Canadian Airlines International	25	56	-	81			
CAI Affiliates <sup>2</sup>	-	33	43	76			
Air Transat <sup>3</sup>	13	7	-	20			
Canada 3000	2	14	-	16			
First Air⁴	-	6	32	38			

3

145

5

8

9

257

3

6

12

493

9

**TABLE 13-18** 

Finnair

### Total

Roval

WestJet

Source: Web sites

1. Air Nova, Air Alliance, Air Ontario and Air BC.

Kelowna Flightcraft<sup>5</sup>

SkyService

2. Air Atlantic (ceased operations as of October 25, 1998) Inter-Canadien, Canadian Regional and Calm Air.

4

91

- Air Transat fleet includes 2-737's which are leased only for the winter season
   First Air fleet includes Air Inuit & NWTAir which was acquired from Air Canada
- Since cessation of operations as Greyhound Air in September 1997, passenger carriage limited.

Source: Carrier Websites, JP Airline-Fleets International, 98-99

In November 1998, two of Air Canada's regional subsidiaries, Air Alliance and Air Nova, began consolidating their operations under a single management group but with two operating divisions; Air Alliance which will remain based in Quebec City and Air Nova in Halifax. This initiative marked a change for Air Canada which had announced earlier in the year that it would attempt to sell Air Alliance.

### **Commercial Aviation Air Transport Services**

Canada's air service industry has two major carriers whose scope and scale of operations are more extensive than any others — Air Canada and Canadian Airlines International. Each airline has comprehensive domestic and international route networks and affiliations with regional carriers that link all parts of the country to transcontinental, transborder and international route systems.

Both carriers strengthened their international reach through strategic global alliances during 1998. Air Canada reinforced its commercial ties within the Star Alliance™, formed in 1997. Canadian Airlines announced its intent to join four other international carriers to form oneworld<sup>TM</sup>. The international scope of the airlines' operations are further enhanced through code-sharing agreements with a large number of foreign air carriers outside these two global alliances. Under code-sharing agreements, passengers are ticketed under one airline but travel on another airline sharing the code of the ticketing carrier.

Table 13-17 shows the airlines partnered in global alliances.

A second group of independent carriers operating jet aircraft

— Air Transat, Canada 3000,
Royal Airlines, SkyService,
WestJet and First Air — offer
inter-regional, transcontinental,
transborder and international
services, scheduled and/or charter,
on a smaller scale.

Table 13-18 shows aircraft used by Canadian air carriers for passenger service.

### Regional and Local Air Services

There are three groups providing regional or local air services in Canada. The first group, including Air BC, Air Ontario, Air Alliance Air Nova and Canadian Regional are operating subsidiaries of either Air Canada or Canadian Airlines. These airlines provide regional domestic or transborder services within the service networks of Air Canada or Canadian Airlines using a mix of jet and large turboprop aircraft. As with their larger corporate parents, there is extensive competition between the operating subsidiaries along network lines. Although the operations of these regional carriers are integrated into their networks, Air Canada and Canadian Airlines sought in 1998 to divest their ownership interests in them (e.g. sale of Canadian North to Air NorTerra, and of Inter-Canadien to Canadian Investors Corp. by Canadian Airlines; and Air Canada's attempt to sell Air Alliance), Table 13-19 shows the affiliation between this group of regional carriers and the major carrier.

Recently, a second group of regional airlines has emerged which are not owned, either in whole or in part, by Air Canada or Canadian Airlines. These regional airlines do however, have code-sharing or other commercial arrangements

# TABLE 13-19 AIR CANADA AND CANADIAN AIRLINES REGIONAL-CODE SHARE PARTNERS

Large Regionals

Other Partners

Air Canada

Air BC Air Creebec
Air Ontario Alberta Citylink
Air Alliana

Air Alliance Aviation Québec-Labrador
Air Nova Central Mountain Air

Northwest Territorial<sup>1</sup>

**Canadian Airlines** 

Air NorTerra<sup>2</sup> Air Alma
Calm Air Ontario Regional
Canadian Regional Pacific Coastal Airlines
Inter-Canadien Region Air

Air Labrador

1 affiliated with First Air 2 doing business as Canadian North

Source: Transport Canada, Air Policy

# TABLE 13-20 CANADIAN CARRIERS OPERATING FOR US BASED COURIER ENTITIES

**Courier Operator** 

Contracted Air Carrier

Airbourne Express

Regency Airlines

Knighthawk Air Express

BAX Global

All Canada Express

DHL

All Canada Express
Western Express Airlines

Emery Air Freight Corp.

Bradley Air Services d.b.a. First Air

ICC Canada

Federal Express

Knighthawk

United Parcel Service

Skylink Express All Canada Express

Source: Transport Canada, Air Policy

TABLE 13-21 LICENCE AUTHORITIES HELD AS AT DECEMBER 31, 1998							
Type: Small Medium Large All-Cargo US						Other Foreign	
Classification Domestic	871	26	13	27	-	-	
International Scheduled Non-Scheduled	13 404	26 22	73 12	3 22	66 764	51 78	
Total Type	1,288	74	98	52	830	129	
Total Canadian					830	129	
Source: Canadian Transportation	Agency						

TABLE 13-22 SUMMARY OF PERSONNEL LICENCES AS OF DECEMBER 1998							
	In Force	Issued in 1998	Male	Female			
Aeroplanes	roice	111 1990	iviale	remale			
Private Pilots	27,891	2,832	26,281	1,610			
Commercial Pilots	9,274	1,075	8,795	479			
Airline Transport Pilots	10,629	664	10,350	279			
Total	47,794	4,571	45,426	2,368			
Helicopters							
Private Pilots	324	43	311	13			
Commercial Pilots	2,777	224	2,713	64			
Airline Transport Pilots	668	50	658	10			
Total	3,769	317	3,682	87			
Permits							
Glider Pilot	5,922	395	5,204	718			
Gyroplane Pilot	22	4	21	1			
Balloon Pilot	265	18	243	22			
Ultra-Light Pilot	2,634	198	2,558	76			
Recreational Pilot	835	305	780	55			
Total	9,678	920	8,806	872			
Other Licences							
Flight Engineers	538	25	528	10			
Air Traffic Controllers	2,142	76	1,987	155			
Aircraft Maintenance	10,617	538	10,534	83			
Total	13,297	639	13,049	248			
Total Licences & Permits	74,538	6,447	70,963	3,575			
Source: Transport Canada Safety & Securit	y						

with the two major carriers, and operate on routes some of which formerly served by the first group of larger regional airlines, using smaller turboprop aircraft. Some airlines in this second group specialize in providing air services to the more remote regions of Canada. As is the case with the first group and the two major carriers, there is competition among them along network lines.

A local tier of regional airlines, operate independently of Air Canada and Canadian Airlines, providing scheduled and charter services with a variety of turboprop and propeller aircraft (e.g. Bearskin Lake and Lab Air). They are most prevalent in remote regions of Canada and are more reliant on air cargo business. Competition among this group is not as strong as among the other regional carriers.

In addition to offering passenger and cargo service, a number of carriers provide all-cargo services using jet or non-jet equipment. These include First Air, Kelowna Flightcraft, Air Charter Ltd., Royal Airlines, All Canada Express, and International Charters Canada (ICC) operated all-cargo services. A new Calgary-based, all-cargo carrier, Canada West Airlines, attempted to enter the all-cargo sector with jet aircraft in 1998, but ceased operations before carrying out any business.

Canadian carriers, including Regency Airlines, Knighthawk Air Express, All Canada Express, Western Express Airlines, First Air, Morningstar, Prince Edward Air and Sky Link Express, are active in both domestic and transborder courier services.

Table 13-20 shows the participation of Canadian air carriers in transborder courier operations.

Table 13-21 lists the economic licence authorities held in Canada in 1998, and illustrates the proportions of operations by aircraft size. It also shows the large number of US-based and other foreign carriers that have the authority to operate to or from Canada on both a scheduled and charter basis.

### Specialty Air Services

The specialty air services sector of commercial aviation operates throughout Canada. Its activities encompass flight training schools; aerial forest fire management and fire-fighting; aerial inspection and construction services; aerial photography and surveying; and advertising, sightseeing, weatheraltering and spraying services. In addition, this sector also provides air cushion vehicle services, glider towing, heli-logging and parachute-jumping services.

#### **Business Aviation**

The business aviation sector continued to grow in 1998, with approximately 130 private companies using a fleet of 250 privately owned and registered aircraft as an alternative to commercial scheduled or charter air services.

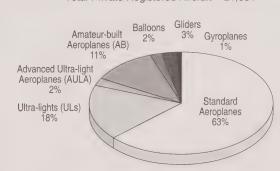
A new approach to gaining access to private corporate aircraft is now developing through the concept of commercially managed fleets of shared access aircraft, called fractional ownership. This has encouraged individuals and corporations, who would not purchase an aircraft alone, to share available flight time with other program participants. Fractional ownership operations in Canada are regulated as commercial air services.

# TABLE 13-23 PROPORTION OF PERSONNEL LICENCES AND PERMITS BY PROVINCE, DECEMBER 1998

	Number of Licences	Per cent of Total
British Columbia	14,784	19.8
Alberta	9,646	12.9
Saskatchewan	2,900	3.9
Manitoba	3,598	4.8
Ontario	23,300	31.2
Quebec	12,924	17.3
New Brunswick	1,150	1.5
Nova Scotia	1,980	2.7
Prince Edward Island	174	0.2
Newfoundland	1,331	1.8
Yukon	354	0.5
Northwest Territories	513	0.7
Other	1,919	2.6
Canada	74,573	100
Source: Transport Canada, Safety & S	Security	

# FIGURE 13-10 PROFILE OF THE RECREATIONAL AVIATION FLEET AS OF DECEMBER 31, 1998

Total Private Registered Aircraft = 21,664



Note: Of the 433 balloons on the registers, only about 25% are flown for recreational purposes. The remaining are flown primarily for commercial reasons.

Source: Canadian Civil Aircraft Register

### GENERAL AVIATION

General aviation describes all private-sector aviation, other than air transportation services. It encompasses business aviation using both fixed-wing aircraft and helicopters, and recreational aviation. In 1998, general aviation activities continued to represent half of the aircraft activity at airports with control towers, although much of the activity is at non-towered airports.

### Recreational Aviation

Recreational aviation refers to private-sector aviation carried out primarily by aviation enthusiasts who participate for the enjoyment of flying. It continues to represent the biggest segment of civil aviation, with over two thirds of Canada's pilots and three quarters of Canada's aircraft (See Tables 13-22 and 13-23 and Figure 13-10). The large number of recreational aviators and recreational aircraft set Canada apart from many nations where aviation tends to be a purely commercial activity.

The special flight operations segment of general aviation was very active in 1998. Over 100 air shows and 50 balloon festivals took place before more than two million spectators. In 1998, Canada hosted the 6th World Hot Air Airship Championships, featuring competitors from around the world. The parachuting community also remained stable with approximately 250,000 parachute descents carried out.

APPENDIX 13-1 RAILWAY OPERATORS BY REGION 1998									
BC Alta Sask Man Ont Que N.B. N.S. Nfld									
Transcontinental	CN CP	CN CP	CN CP	CN CP	CN CP	CN CP	CN CP	CN	
Regional and Local	BCR OKAN SRY	RCW RLW RMN	SRC CTR HBR	GWWD HBR	GEXR ONR AC AR ROV OLO HCR RSO BC STER OCR	QNSL CFCR CFRS CDAC CFC QSR ROV CFBC CFG CFQG CFQG CFAM MR CFRR SLAR NCR	NBS NER EMR	DVR CBNS WHR	QNSL
Terminal or Switching					ETR PCHR	Arnaud			WLR
US Railways	BN UP			BN <sup>3</sup>	CSXT NS <sup>2</sup>	CR	BAR		
Passenger or Commuter	VIA <sup>3</sup> AMTRAK <sup>3</sup> BCR BC TRANSIT	VIA³	VIA <sup>3</sup>	VIA <sup>3</sup>	VIA <sup>4</sup> GO	VIA <sup>3</sup> AMTRAK <sup>3</sup> AMT <sup>3</sup>	VIA <sup>3</sup>	VIA <sup>3</sup>	

<sup>1</sup> Non-operating, owned trackage only

Note: A number of bridge or terminal companies are not identified here, nor are subsidiaries of other companies. A number of rail tourist operations including the WPY, WSJR and GCRT have also not been included. Note that RMN also operate into the NWT.

AC Algoma Central Agnore métropolitaine de Transport AR Amprior & Renfrew Arnaud Arnaud Arnaud Arnaud BAR Bangor & Aroostock BC Barrie – Collingwood BCR BC Rail BN Burlington Northern CBNS Cape Breton and Central Nova Scotia CDAC Canadian American CFBC Chemin de fer de la Baie-des-Chaleurs CFC CFCR Chemin de fer Charlevoix CFCR Chemin de fer de la Gaspésie CFG Chemin de fer de la Matapédia CFG Chemin de fer du Matapédia CFG Chemin de fer Rivière-Romaine CFG Chemin de fer Rivière-Romaine CFR Chemin de fer Roberval-Saguenay CFR CARIO CSXT CSX CARIO CRA			Legend		
ETR Essex Terminal UP Union Pacific GCRC Great Canadian Railtours WHR Windsor and Hantsport GEXR Goderich & Exeter WLR Wabush Lake GWWD Greater Winnipeg Water District WPY White Pass & Yukon	AMT AR Arnaud BAR BC BCR BN CBNS CDAC CFC CFC CFC CFG CFM CFQG CFRR CFRS CSXT CTR DVR	Agence métropolitaine de Transport Amprior & Renfrew Arnaud Bangor & Aroostock Barrie – Collingwood BC Rail Burlington Northern Cape Breton and Central Nova Scotia Canadian American Chemin de fer de la Baie-des-Chaleurs Chemin de fer Charlevoix Chemin de fer Cartier Chemin de fer de la Gaspésie Chemin de fer de la Matapédia Chemin de fer Québec-Gatineau Chemin de fer Rivière-Romaine Chemin de fer Roberval-Saguenay CSX Carlton Trail Devco	MR NBS NCR NER NS NV OCR OKAN OLO ONR PCHR QNSL QSR RCW RLW RMN ROV RSO SLAR SRC SRY	New Brunswick Southern Nipissing Central New Brunswick East Coast Norfolk Southern Northern Vermont Ottawa Central Okanagan Valley Ontario L'Orignal Ontario Northland Port Colborne Harbour Quebec, North Shore & Labrador Quebec Southern RaiLink Central Western RaiLink Lakeland & Waterways RaiLink Mackenzie Northern RaiLink Ottawa Valley RaiLink Southern Ontario St. Lawrence & Atlantic (Quebec) Southern Rail Co-operative Southern Railway of BC	
GEXR Goderich & Exeter WLR Wabush Lake GWWD Greater Winnipeg Water District WPY White Pass & Yukon	CTR DVR EMR	Carlton Trail Devco Eastern Maine	SRC SRY STER UP	Southern Rail Co-operative Southern Railway of BC St. Thomas & Eastern Union Pacific	
HCR Huron Central	GEXR GWWD HBR	Goderich & Exeter Greater Winnipeg Water District Hudson Bay	WLR WPY	Wabush Lake White Pass & Yukon	

<sup>2</sup> Running rights, no track owned in Canada

<sup>3</sup> Running rights

<sup>4</sup> Running rights and owned trackage

# FREIGHT TRANSPORTATION

In terms of volume, bulk commodities traffic showed a decline due to the difficulties of Asian economies. Canada - US trade was a source of increase in freight traffic.

Two chapters have already reported some freight transport activities: the chapter on Transportation Infrastructure and the one on Transportation and Trade. This chapter on Freight Transportation complements the Trade chapter. It approaches the question of freight transportation from a modal perspective.

A modal landscape of freight traffic gives a sense of the relative use made of the different modes. The overview of the most recent traffic information for each mode provides some commodity level details and, when possible, a regional breakdown. The information presented gives a sense of the inter-relationships

between modes and markets, but falls short of developing an intermodal/ multimodal perspective. Changes in traffic level of a mode of transportation can come from either changes in traffic volumes, modal shifts or a mix of the two.

The coverage of modal freight activities is based on information available and is subject to the limitations imposed by data availability. Such limitations constrained the analysis. Yet it provides some of the background to understand the price, productivity and financial results findings presented in the last chapter of the report.

### **RAIL TRANSPORTATION**

While rail freight traffic in 1998 did not reach the record levels of 1997, it was very strong compared with recent years. Decreased flows in key sectors, however, did lead to a drop in both tonnes and tonne-kilometres.

Aggregate traffic volumes decreased by about 3.6 per cent (compared with the over seven per cent increase in 1997). The forest product, coal, fertilizer materials and grain sectors accounted for over 50 per cent of total traffic (in tonnes) in 1998. Decreased traffic in each of these

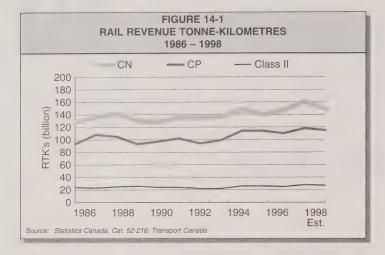
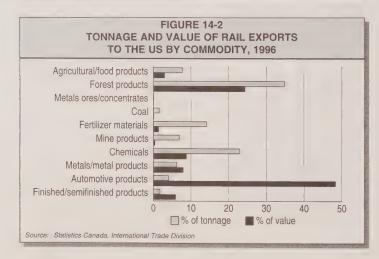


TABLE 14-1 RAIL EXPORTS AND RAIL GROWTH TO THE U.S., BY PROVINCE							
	(000 tonnes	3)					
	1997 Tonnage to US	1987-1992 Per cent	1992-1997 Per cent				
Newfoundland Prince Edward Island Nova Scotia New Brunswick Quebec Ontario Manitoba Saskatchewan Alberta British Columbia Northwest Territories Total	0.3 0.0 639.9 906.7 11,900.6 14,261.6 2,222.7 11,052.4 9,686.1 7,595.2 1.1 <b>58,266.6</b>	-100.0 -28.9 -5.4 0.1 1.4 6.5 7.7 4.1 7.2 3.5 -76.6 <b>4.3</b>	-45.3 14.7 16.1 6.7 5.3 21.1 15.1 5.7 -0.4 127.6 <b>6.9</b>				



sectors, however, eclipsed increased flows in most other sectors.

For Canadian operations in 1997 compared with 1996, output increased by almost ten per cent for CN and by nearly seven per cent for CP Rail, with the Class I carriers' revenue tonne-kilometres reaching 161 and 118 billion, respectively. Class II output reached over 28 billion revenue tonne-kilometres, an increase of close to 11 per cent over the previous year.

For their systems in 1998, CN and CP Rail reported decreases in output, with revenue tonne-kilometres down 5.8 per cent to 113 billion, and 3.5 per cent to 102 billion, respectively.

Estimated output for Canadian operations in 1998 was also down (based on three quarters of data on Canadian operations and four-quarters of system data): 148 billion tonne-kilometres for CN and 115 billion for CP Rail.

In 1998, Class II railways' estimated share of revenue tonne-kilometres was relatively small at less than nine per cent. Even so, Class II carriers carried approximately 30 per cent of freight by tonnage and accounted for about 25 per cent of track operated. Over 50 per cent of Class II traffic is iron ore carried by two railways: Quebec, North Shore & Labrador Railway (QNSL) and Cartier Railway.

Figure 14-1 shows output in revenue tonne-kilometres for the two Class I carriers and the Class II industry from 1986 to 1998. The major contributor to year-to-year fluctuations in revenue tonne-kilometres has been domestic traffic, while to a large degree, the basis for the generally increasing trend has been trade with the US.

### RAIL TRAFFIC - TRADE WITH THE US

In 1997, northbound and southbound traffic together reached 67.6 million tonnes, a 14 per cent increase over the previous year. US imports and exports accounted for over a quarter of the tonnage moved over the Canadian railway system.

### **Exports**

Southbound tonnage (mostly transported by Class I carriers) reached 52 million tonnes in 1997, a 12.8 per cent increase over 1996. Of this volume, 44.6 per cent originated from the Prairie provinces, and over 20 per cent in each of Ontario and Quebec. British Columbia was the source of a further eight per cent and 3.4 per cent originated from the Atlantic region. In fact, the Prairies have contributed the most to the increase in exports, with each province approximately doubling tonnage shipped to the US from 1987 to 1997.

Most growth in rail exports took place in the recent past, with average annual growth 4.3 per cent from 1987 to 1992, and 6.9 per cent from 1992 to 1997.

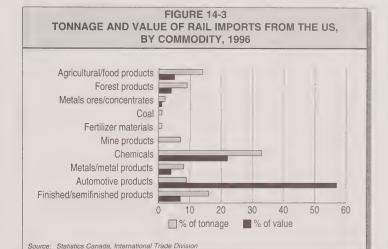
Table 14-1 shows 1997 export tonnage by province, and average annual growth of exports to the US from 1987 to 1992 and 1992 to 1997.

Forest products accounted for over 14.5 million tonnes (almost a third of the tonnage) shipped to the US in 1997. Shipments from British Columbia and Quebec accounted for about half of these exports, and Ontario and Alberta accounted for about a further 35 per cent. Fertilizer materials were the next most prominent exports (10.8 million tonnes), followed by grains (3.2 million tonnes), intermodal traffic

### TABLE 14-2 RAIL IMPORTS, IMPORT GROWTH BY PROVINCE

	(000 tonnes	s)	
	1996 Tonnage from US	1986-1991 Per cent	1991-1996 Per cent
Newfoundland	0.2	-19.6	10.0
Prince Edward Island	0.0	-25.6	-100.0
Nova Scotia	461.8	15.5	36.5
New Brunswick	297.2	14.2	0.7
Quebec	5,249.7	6.6	8.1
Ontario	7,068.0	0.6	10.2
Manitoba	613.6	11.7	6.1
Saskatchewan	969.0	6.3	9.3
Alberta	1,736.6	11.1	16.0
British Columbia	1,953.0	-2.1	10.7
Northwest Territories	54.5	-31.4	268.7
Total	18,403.6	3.6	10.1

Source: Transport Canada adapted from Statistics Canada, Cat. 52-216



(2.5 million tonnes) and road motor vehicles and liquid petroleum gas (about 1.5 million tonnes each).

According to trade data, the value of rail exports totalled \$50.5 billion in 1996. For most of these commodity sectors, there is a disparity between the value of exports and total tonnage. For example, automotive products accounted for 48 per cent of exports by value, but only four per cent of tonnage.

Figure 14-2 compares tonnage and value for exports to the US for ten commodity sectors in 1996.

#### **Imports**

Northbound rail tonnage reached 15.6 million tonnes in 1997, up 18 per cent from 1996. Ontario accounted for 40 per cent of this total, Quebec 30 per cent, Prairies provinces over 19 per cent, with the remainder split between British Columbia and the Atlantic provinces. Since 1986, Nova Scotia,

# TABLE 14-3 AVERAGE VALUE PER TONNE OF RAIL EXPORTS AND IMPORTS, BY COMMODITY, 1996

	in current \$CDN		
Agricultural and food products	Exports 394	Imports 402	
Forest products	711	451	
Metals ores and concentrates	356	689	
Coal	83	126	
Fertilizer materials	97	206	
Mine products	58	34	
Chemicals	389	749	
Metals and metal products	1,294	579	
Automotive products	12,037	7,500	
Finished and semifinished products	3,402	530	
Total	1,016	1,164	
Source: Statistics Canada, International Trade Division			

### JUSTICE ESTEY REPORT GRAIN HANDLING AND TRANSPORTATION REVIEW

In late December, the Honourable Willard Z. Estey, CC,QC submitted his report on the grain handling and transportation system in Canada after a year long review.

Justice Estey proposed a package of 15 recommendations to improve the operation of the system. Key recommendations included:

- Creation of a commercial handling and transportation system, with grain companies and railways responsible for handling and transportation and the Canadian Wheat Board responsible for marketing grain,
- Use of a commercial system for allocating grain cars,
- Removal of the existing freight rate cap for grain, conditional upon a commitment by the railways to limit revenues,
- Amend the line transfer provisions of the Canada Transportation Act to enhance rail competition by encouraging the creation of short line railways and allowing them to obtain running rights on the lines of the national carriers,
- An enhanced arbitration process for resolving disputes, and
- A review after the 2000/2001 crop year of the productivity gains of the industry and the flow-through of those gains to farmers.

Government is consulting with the grain handling and transportation industry to consider ways in which Justice Estey's recommendations could be implemented.

New Brunswick, Quebec, Manitoba, Saskatchewan, Alberta and the Northwest Territories have each more than doubled their imports from the US. As with exports, most growth in imports has taken place in recent years: the average annual growth in imports was 3.6 per cent from 1987 to 1992 and 10.1 per cent in the next five years.

Table 14-2 shows 1997 import tonnage by province, and average annual growth of exports from 1987 to 1992 and 1992 to 1997.

In 1997, intermodal traffic accounted for 2.2 million tonnes of imports from the US. Plastics and motor vehicle engines and parts were the next most important imports, with 0.9 million tonnes of each entering from the US.

As with exports, there is a large disparity between the value of imports and total tonnage for the ten commodity sectors. The pattern is similar to that of exports, except in the metals/metal products and finished/semi-finished categories.

Figure 14-3 compares import tonnage and value for ten commodity sectors in 1996.

In 1996, average value per tonne was greater for exports than for imports in five sectors: mine products, metals/metal products, forest products, automotive products and finished/semi-finished products. In aggregate, however, average value was 14 per cent higher for imports than for exports.

Table 14-3 shows value per tonne for ten commodity sectors in 1996.

### TRAFFIC SECTORS

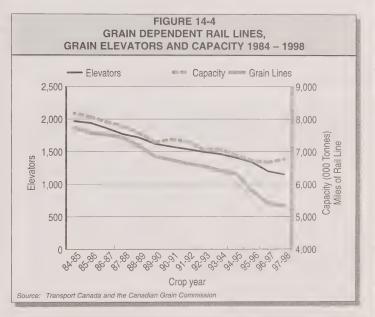
The majority of railway traffic transported in 1998 can be categorized into seven major commodity sectors: grain, forest products, coal, ores and mine products, fertilizers and fertilizer materials, industrial products, and intermodal traffic. Traffic in six of these sectors - the exception being industrial products - was down from 1997 levels, likely because of effects associated with the economic downturn in Asia. In industrial products, despite a drop in the automotive sector, overall traffic was buoyed up by increased traffic in petroleum products. metals and chemicals.

### **RAILWAY AND GRAIN SYSTEM RESTRUCTURING**

Changes in traffic levels brought about by closure of manufacturing or processing facilities, by competition from trucking by reduced commodity demand and by fundamental reorientation of logistics systems are the principal factors influencing the economics of rail lines. Railway restructuring, like the structural changes that have been occurring in many other sectors of the economy is nothing new — only the character changes.

In western Canada, for example, the number of grain elevators and the aggregate capacity of the grain elevation system has been declining since the 1970 peak of almost 5,000 elevators located at 2,000 delivery points. In 1984 the elevator population was about 2,000 and declined by a further 42% to about 1,150 in 1997 at about 800 delivery points. During the 1984-1997 period, the grain dependent prairie rail network shrank by about 32% with a noticeable drop occurring in mid-1996 reflecting the discontinuance of light steel (low volume) lines following the passage of the Canada Transportation Act. Interestingly, grain elevator capacity, although declining by about 18% in this period, has actually stabilized in the past several years. This phenomenon reflects the closure of low capacity elevators at many locations throughout the prairies and massive strategic investments by the grain industry in high throughput facilities at a smaller number of key locations.

In fact, grain elevator closures or reductions in capacity are continuing to occur in areas which are served by rail lines with relatively low traffic volumes - lines whose economic future is questionable. Conversely, investment by grain companies in new high throughput facilities is occurring principally on high traffic volume rail lines. Essentially the same trends. then, are occurring in both the grain and rail industries (and in other sectors for that matter). Portions of both systems representing low throughput and marginal economics are being rationalized in favour of concentrating activity at a smaller number of higher volume, low unit cost facilities.



Total traffic started out with a strong first quarter, reaching volumes six per cent higher than in 1997. It then varied between 1996 and 1997 levels in the second and third quarters. By the end of the year, total traffic reached 257 million tonnes, 96 per cent of 1997's record levels, but 104 per cent of 1996 levels.

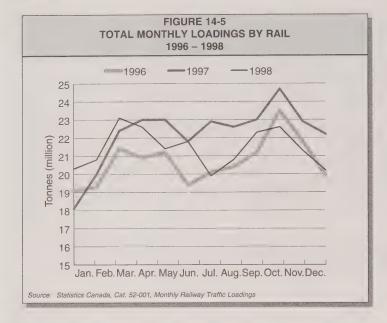
Figure 14-5 compares total monthly traffic for 1998 with that for 1997 and 1996.

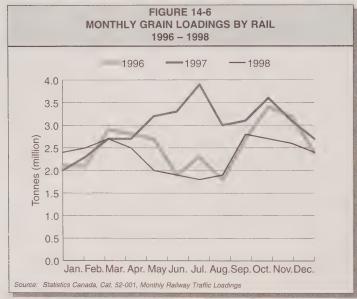
The following sections briefly describe monthly rail traffic for each of the seven major sectors.

### Grain

Most grain moves from the Prairies to British Columbia to be exported. Large volumes also move to the US and to the Port of Thunder Bay to be exported via the St. Lawrence Seaway.

After a bumper crop and increased loadings in 1997, grain shipments in 1998 fell closer to 1996 levels. Total annual tonnage reached only 28 million tonnes, 21 per cent less than 1997 levels, and seven per cent lower than 1996 levels. Although traffic over the first four months exceeded 1997 levels by three per cent, monthly





loadings from May to August were each more than a million tonnes below corresponding 1997 levels. This drop occurred because production was not as exceptional as in 1997, and grain markets were slightly softer. Although traffic recovered in September, loadings in

the last quarter were well below even 1996 levels.

While grain did account for 11 per cent of total tonnage moved in 1998, the drop in total grain shipments was the largest contributor to the drop in overall traffic.

Figure 14-6 shows monthly grain loadings since 1996.

#### **Forest Products**

In aggregate, forest products accounted for 39 million tonnes for 15 per cent of total traffic. The gains made in the processed forest products sector were offset by the traffic decrease in unprocessed forest products, resulting in total traffic almost seven per cent lower than in 1997.

Most traffic of unprocessed forest products – logs, pulpwood and pulpwood chips, woodpulp – is intraprovincial: within Quebec, within Ontario and within British Columbia. One-quarter of the traffic by tonnage is exports to the US.

Traffic of unprocessed forest products totalled 20 million tonnes in 1998, only 82 per cent of 1997 levels. While first quarter traffic increased by almost three per cent, second, third and fourth quarter shipments were 1, 11 and 16 per cent below levels in the same quarter of 1997. (See Figure 14-6.) Over 60 per cent of this drop was in shipments of pulpwood chips in Eastern Canada. This may reflect a five-month strike at Abitibi-Consolidated between June and November. Traffic in the last quarter did not recover.

Traffic of processed forest products – lumber, plywood, paper, newsprint and packaging – is dominated by exports from Ontario, Quebec and British Columbia to the US (about 60 per cent of traffic). US-bound shipments from other provinces and bridged traffic (originating in and destined for the US) account for much of the remaining flows. Domestic traffic is dominated by flows within and between Ontario and Quebec, and flows within British Columbia.

Annual traffic of processed forest products exceeded levels of the previous four years, reaching 19 million tonnes in 1998, eight per cent higher than in 1997. Monthly loadings fluctuated generally above 1997 levels, and net figures for each quarter were higher in 1998. Softness in the Asian market and lower exports to Japan, particularly of softwood lumber, did not appear to affect rail shipments.

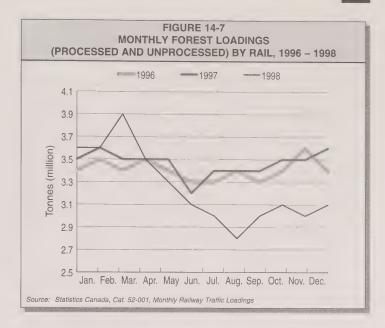
Figure 14-7 shows aggregate (processed and unprocessed) traffic for 1996 to 1998.

#### **Ores and Mine Products**

This sector is comprised of copper, lead, zinc, aluminum, iron and other ores, and by sand, gravel and crushed stone, crude gypsum and asbestos, salt, cement and other mine products. As a whole, the sector's performance was similar to that of 1997. Aggregate traffic was down by less than one per cent, mostly because iron ore flows in the last quarter were down 18 per cent compared to 1997. Ores and mine products were the largest contributors to total traffic, accounting for 23.5 per cent of annual tonnage in 1998.

Iron ore dominates this sector, accounting for 39 million tonnes in 1998, or about 65 per cent of tonnage in this sector. Virtually all of this traffic flows from mines in northern Quebec and Labrador to ports on the St. Lawrence via Quebec, Northshore & Labrador Railway and Cartier Railway. Shipments of iron ore in 1998 were 0.6 per cent lower than in 1997.

The other ores and mine products make up the remaining 21.4 million tonnes in this sector. Flows in 1998 were down by just over one per cent from 1997 levels.



### Fertilizers and Fertilizer Materials

In aggregate, transport of fertilizers and fertilizer materials was down by over three per cent in 1998. Whereas in the two previous years, June tonnage dropped by 30 to 37 per cent from April, the decline in June 1998 was only 14 per cent. This reflected more moderate flows throughout the entire year.

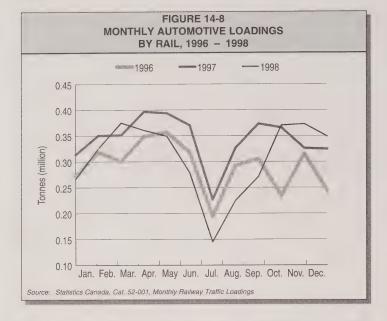
Potash, produced mostly in Saskatchewan, accounts for over 50 per cent of the traffic in this sector. Operation of the new potash terminal at the Port of Portland, Oregon, did not appear to affect 1997 rail tonnage moved to Vancouver for export - marine exports totalled 4.3 million tonnes, up from 3.6 million tonnes in 1996. However, in 1998, the Port of Vancouver reported a 20 per cent drop in potash traffic, although rail tonnage dropped only two per cent to 13.9 million tonnes in that year.

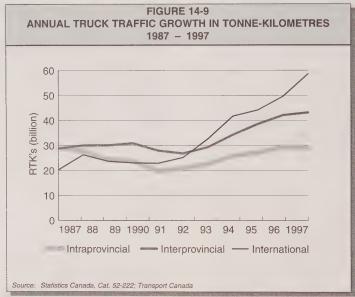
In recent years, approximately 70 per cent of sulphur traffic has been from Alberta to British Columbia, with about three quarters of this destined to ports for export. Most of the remaining tonnage flows to the US, again from Alberta, but also in smaller quantities from New Brunswick, Ontario, Quebec, Saskatchewan and British Columbia. With 1998 prices lower than the cost to market their products, producers likely chose to build inventory. As a result, sulphur traffic dropped to 6.9 million tonnes in 1998, a decrease of six per cent.

In 1998, 6.1 million tonnes of phosphate rock and other fertilizer materials were also transported in Canada, down by 2.7 per cent from 1997.

### Coal

Coal and coke traffic was strong in the first quarter of 1998, with flows 14.2 per cent higher than in the same quarter of 1997. Traffic dropped in the second and third quarters, however, and finished the





year at 39.1 million tonnes, seven per cent below 1997 levels. Most coal flows from western Canada to the ports of Vancouver and Prince Rupert. As about a third of this is usually exported to Japan, much of the drop in shipments in 1998 can be attributed to sagging Japanese steel production.

Coal has been accounting for a slightly decreasing proportion of total rail traffic in recent years: 16.3 per cent of the total in 1996, 15.8 per cent in 1997 and

15.5 per cent in 1998. However this sector is still second in importance to ores and mine products in terms of tonnage transported.

### **Industrial Products**

Industrial products include automobiles and parts, refined petroleum products, chemicals and metals. In aggregate, this sector accounted for 14 per cent of total traffic in 1998, up from 11.8 per cent in 1997.

Generally, about one half of automotive traffic flows from Ontario to the US, and about one quarter consists of flows from the US to Ontario and Quebec. Much of the rest moves from Ontario to other provinces and from Quebec to the US.

Total automotive traffic reached 3.7 million tonnes, down from 4.1 million tonnes in 1997. Automotive traffic accounted for 10 per cent of industrial traffic in 1998.

Automotive traffic started relatively strong in 1998. However, GM strikes at two plants in Flint, Michigan, in June and July affected CN automotive traffic and revenue. Total automotive traffic hit a low of 64 per cent of 1997 monthly tonnage in July. CN's secondquarter revenue was down 16 per cent from 1997, while third-quarter revenues were even lower, 31 per cent lower than 1997 levels. In the fourth quarter, traffic recovered, exceeding 1997 levels by over seven per cent.

Figure 14-8 shows trends in monthly automotive traffic from 1996 to 1998.

Alberta is the major origin of chemical traffic, followed by Ontario, Quebec, and Manitoba. Alberta-shipments are destined for British Columbia and Ontario, while Quebec and Ontario shipments remain in the region. About 15 per cent of traffic originates in the US, most of which goes to Ontario and Quebec. The US, however, is the predominant destination for chemical traffic, receiving over one-third of total tonnage, mostly from Alberta, Ontario and Quebec.

Chemical traffic is the largest contributor to the industrial traffic sector, accounting for 41 per cent in 1998. Monthly traffic was consistently high and fairly moderate throughout the year. The annual tonnage reached 14.8 million tonnes, 8.6 per cent higher than in 1997.

Approximately one third of petroleum product traffic flows from the six central and western provinces to locations in the US. Other flows of significance are within and between Ontario and Quebec, and from Alberta to Ontario and British Columbia.

Petroleum products accounted for 24 per cent of industrial tonnage in 1998. The 1998 annual tonnage was 8.6 million tonnes, up from 5.2 million tonnes in 1997. Tonnage over the first five months was nine per cent higher than in 1997. In June, increased flows of liquid petroleum gas and miscellaneous refined petroleum products caused petroleum traffic to jump by over 100 per cent to 813,000 tonnes. Traffic remained at these high levels for the rest of the year.

The metals sector includes primary and manufactured metals, scrap and waste metals, and machinery and parts. One third of metals traffic is within and between

TABLE 14-4
REVENUES OF FOR-HIRE TRUCKING ACTIVITY
BY COMMODITY GROUP, 1997

_		Domestic		International		Total
Commodities	(millions)	Percent	(millions)	Percent	(millions)	Percent
General freight	\$2,616.1	41.0	\$2,146.1	47.1	\$4,762.1	43.5
Food products	1,120.2	17.6	539.8	11.8	1,659.9	15.2
Forest products	936.6	14.7	698.5	15.3	1,635.1	14.9
Automotive products	333.1	5.2	532.8	11.7	865.9	7.9
Steel and alloys products	444.3	7.0	355.6	7.8	799.8	7.3
Chemical products	391.2	6.1	203.9	4.5	595.1	5.4
Petroleum Products	330.4	5.2	36.1	0.8	366.6	3.4
Non-metallic minerals	181.8	2.9	39.1	0.9	221.0	2.0
Metals/ores	23.5	0.4	8.0	0.2	31.4	0.3
Total Revenues	\$6,377.1	100.0	\$4,559.8	100.0	\$10,936.9	100.0

Source: Transport Canada; Statistics Canada, special tabulation from For-Hire Commodity Origin-Destination

Ontario and Quebec. Another third moves to the US from Quebec, Ontario, Saskatchewan, British Columbia and Manitoba. Rail imports from the US to Alberta, Ontario and Quebec make up another ten per cent.

In 1998, metals accounted for 24.8 per cent of industrial traffic. Even though traffic in the last three quarters dropped closer to 1997 levels, a strong first quarter – 18 per cent higher than in 1997 – boosted the annual tonnage to 8.9 million tonnes, a 3.6 per cent increase overall.

### Intermodal

For intermodal traffic, origin and destination statistics are similar in terms of both volumes and geography. Quebec and Ontario generate and receive about half of intermodal traffic. Nova Scotia (port traffic), Alberta and British Columbia collectively account for about one third. Intermodal imports from and exports to the US comprise the other major flow.

Intermodal traffic throughout 1998 generally followed the same trend as in 1997, but at slightly lower levels of tonnage. This sector accounted for 6.8 per cent of total traffic, almost the same proportion as recorded for 1997.

CP reported higher intermodal revenue for 1998, whereas CN suggested that labour negotiations might have reduced its intermodal revenue for the year.

Trailer-on-flat car (TOFC) tonnage continued to decrease, following the trend of recent years. The total annual tonnage was 1.4 million tonnes, 27.9 per cent lower than in 1997. The dramatic growth of container-on-flat-car (COFC) tonnage since the early 1990s was arrested in 1998, with annual tonnage at 16.2 million tonnes, just 2.8 per cent higher than the year before.

### TRUCKING TRANSPORTATION

### DOMESTIC VS INTERNATIONAL TRUCK TRAFFIC

Since 1991, the number of tonne-kilometres<sup>1</sup> moved by for-hire

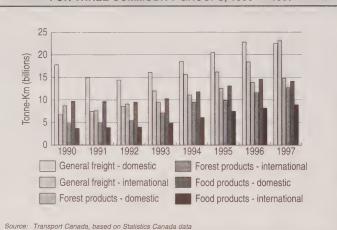
<sup>1</sup> Tonne-kilometres is a physical measure of trucking activities used to assess trends in traffic. It captures two of the important dimensions of the freight traffic carried by truck — volume and distance.

Source: Transport Canada; Statistics Canada, special tabulation

TABLE 14-5	
TRAFFIC VOLUME OF FOR-HIRE	TRUCKING
BY COMMODITY GROUP,	1997

(Million tonne-kilometres)							
Commodities	Domestic	%	International	%	Grand Total	%	
General freight	22,549.7	31.2	23,137.8	39.5	45,687.5	34.9	
Forest products	14,774.8	20.5	12,683.9	21.6	27,458.7	21.0	
Food products	14,130.3	19.6	8,899.7	15.2	23,030.0	17.6	
Steel and alloys products	5,913.5	8.2	5,205.8	8.9	11,119.2	8.5	
Chemical products	4,437.9	6.1	2,574.9	4.4	7,012.8	5.4	
Petroleum Products	5,408.6	7.5	668.1	1.1	6,076.7	4.6	
Automotive products	1,442.0	2.0	4,522.8	7.7	5,964.8	4.6	
Non-metallic minerals	3,137.0	4.3	778.5	1.3	3,915.5	3.0	
Metals/ores	446.5	0.6	141.6	0.2	588.0	0.4	
Total Tonne-kilometres	72,240.2	100.0	58,613.2	100.0	130,853.3	100.0	

FIGURE 14-10
DOMESTIC VERSUS INTERNATIONAL FOR-HIRE TRUCK TRAFFIC
FOR THREE COMMODITY GROUPS, 1990 – 1997



trucks has increased steadily in both the domestic and international markets. Domestically, tonne-kilometres rose from 47.7 to 72.2 billion over the period 1991-97, for an average annual increase of 7.2 per cent, while internationally, the average annual growth of tonne-kilometres reached near 17 per cent (from 22.9 to 58.5 billion), over the same period.

In light of these increases, the relative importance of domestic and international markets in the total

traffic of Canadian-based for-hire trucking firms has been shifting in the past decade. Since 1991, the domestic share of total tonne-kilometres has decreased by 15 per cent, resulting in a corresponding increase in the international share of total tonne-kilometres.

Figure 14-9 shows annual growth in truck traffic in tonne-kilometres from 1987 to 1997.

### TRUCK TRAFFIC BY COMMODITY GROUP

In terms of value, general freight (primarily manufactured products and fabricated materials) accounted for a significant share of truck traffic in 1997. Domestic traffic in this commodity group generated approximately \$2.6 billion, or 41 per cent of all domestic revenues, while international traffic generated approximately \$2.1 billion, or 47 per cent of all international revenues. The next most valuable commodities transported - domestic and international combined - were food products at about \$1.7 billion (15.2 per cent of the total) and forest products at about \$1.6 billion (14.9 per cent). Collectively, these three commodities accounted for almost 75 per cent of the carriers' revenues in 1997.

Table 14-4 shows the revenues of for-hire trucking activity by commodity group for 1997.

In terms of tonnes-kilometres, general freight accounted for 22.5 billion tonne-kilometres domestically (31.2 per cent of domestic traffic) and 23.1 billion tonne-kilometres to the US and Mexico (39.5 per cent of international traffic). Combined, this represents 35 per cent of the total tonne-kilometres. In aggregate, general freight, food products and forest products accounted for almost 75 per cent of the carriers' total tonne-kilometres in 1997.

Table 14-5 shows the volume of for-hire trucking traffic by commodity group for 1997.

Three major sources were responsible for the growth in freight traffic carried by trucking: general freight, where the transborder activities have surpassed the domestic volumes in terms of tonnes-kilometres; forest products, where the growth in both domestic and transborder flows has been significant; and food products, where trucking has been handling an increasing volume of freight.

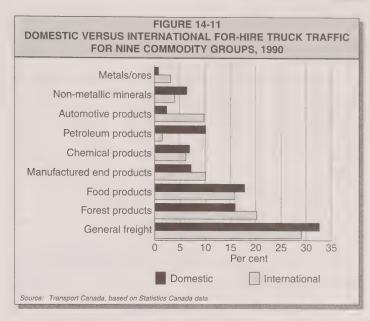
Figure 14-10 compares domestic and internationl for-hire truck traffic for the three largest commodity groups — general freight, forest products and food products — from 1990 to 1997.

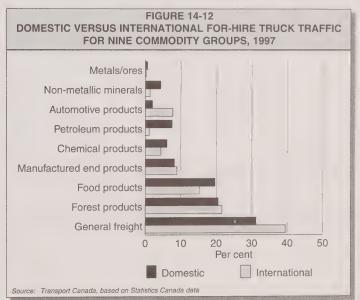
Figures 14-11 and 14-12 compare the relative share of domestic and international for-hire truck traffic for nine commodity groups in 1990 and 1997.

### TRUCK TRAFFIC BY REGIONS

In 1997, four provinces accounted for 85 per cent of total tonne-kilometres moved by Canadian-based for-hire trucks. Ontario dominated in domestic and international sector, with a combined share of 38 percent of total tonne-kilometres, followed by Quebec (22 per cent), Alberta (14 per cent) and British Columbia (11 per cent). Table 14-6 shows the provincial distribution.

At the inter-provincial level, traffic flows between Quebec and Ontario reached 9.5 billion tonnekilometres in 1997, including 5.1 billion on the "Quebec to Ontario" leg. Main commodity groups moved by for-hire trucks from Quebec to Ontario were forest products, iron & steel products, and other manufactured products (machinery, general freight,...). On the reverse, trucks moved food-processed products, iron & steel products, and manufactured items (machinery, equipment, general freight) from Ontario to Quebec.





### **TABLE 14-6** FOR-HIRE TRUCK TRAFFIC BY SECTOR AND PROVINCE, 1997

(Million tonne-kilometres)						
	Intra-Prov.	Inter-Prov.	International	Total	Share (%)	
Ontario	10,182	14,345	25,069	49,596	37.9	
Quebec	6,181	8,385	13,925	28,491	21.8	
Alberta	5,163	6,776	6,212	18,151	13.9	
B.C.	4,267	4,667	5,618	14,552	11.1	
Man.,Sas.&Terr.	1,714	5,506	4,271	11,491	8.8	
Atlantic prov.	1,556	3,498	3,518	8,572	6.6	
Total:	29,063	43,178	58,613	130,853	100.0	

Totals may not add due to rounding; Canadian domiciled for-hire Class I and II carriers;

"International" includes exports and imports; "Inter-Provincial" are loadings based; "Territories" include Yukon and Northwest Territories.

Source: Statistics Canada, Special Tabulation

### **TABLE 14-7** FOR-HIRE TRUCK INTERNATIONAL TRAFFIC BY SECTOR AND PROVINCE, 1997

(Million tonne-kilometres)

Province	US Region	Southbound movements ("Exports")	Northbound movements ("Imports")	TOTAL	Share (%)
Ontario	US Central	6,912	4,471	11,382	19.4
Ontario	US South	3,368	3,298	6,665	11.4
Quebec	US South	2,476	1,849	4,325	7.4
Quebec	US North-East	2,859	1,446	4,305	7.3
Prairie prov.	US Central	2,469	1,792	4,261	7.3
Ontario	US North-East	2,230	1,825	4,055	6.9
Quebec	US Central	2,592	1,338	3,930	6.7
B.C.	US West	2,111	1,621	3,733	6.4
Sub-total		25,017	17,640	42,657	72.8
Other moveme <b>TOTAL</b> :	nts	9,003 <b>34,020</b>	6,954 <b>24,594</b>	15,957 <b>58,613</b>	27.2 <b>100.0</b>

US North-East includes US New England and US Middle Atlantic states; US Central includes some states bordering the Great Lakes and other central states such as North & South Dakota, Nebraska, Iowa, Kansas and Missouri. US West includes US Pacific states and US West Mountain states

Source: Transport Canada, adapted from Statistics Canada special tabulation

Other major interprovincial flows included the Ontario/Prairie provinces traffic (7.4 billion tonnekilometres, including 5.0 billion in the "Ontario to Prairies" direction), and the British Columbia/ Prairie provinces traffic at 6.2 billion tonne-kilometres.

At the international level, the most important traffic flows involved Ontario and the US Central states, totalling 11.3 billion tonne-kilometres (6.9 billion tkms as southbound movements and 4.5 billion as northbound shipments). Main commodity groups shippped by for-hire trucks from Ontario to US Central states were motor vehicles & accessories, forest products, and manufactured products (machinery, equipment, general freight,...) On the reverse, iron & steel products, motor vehicles & accessories and manufactured items were moved by for-hire trucks to Ontario from those same Central states (Table 14-7).

The second major traffic flows included Ontario and the US Southern states: this traffic totalled 6.7 billion tonne-kilometres in 1997 and was equally divided into southbound and northbound movements

#### **Truck Sales**

Truck sales reflect the health of the trucking industry in Canada: strong sales levels are generally the result of a healthy period of demand for trucking services. In 1998, more than 29,000 new Class 8 trucks (vehicles with a gross vehicle weight of 15,000 kilograms or more) were sold, exceeding 1997 sales by seven per cent and establishing a new sales record. A number of factors favourable to heavy truck sales contributed to this: a sustained level of strong manufacturing and trade activities;

relatively favourable interest rates; overall sound financial performance from the industry; controlled inflation; and increased consumer spending. New truck purchases reflected pent-up demand following deferred fleet replacement during the 1990/92 recession and strong growth in demand for truck freight services since 1993.

Figure 14-13 shows the number of Class 8 trucks sold each year in Canada from 1990 to 1998.

Over 75 per cent of the Class 8 trucks purchased in 1998 were in Alberta, Ontario and Quebec. Record sales in 1998 were led by Ontario, where 11,947 vehicles were sold, 2,200 more than in 1997.

Table 14-8 shows the sales of Class 8 by province in 1997 and 1998.

Over 293,000 Class 8 large trucks were registered in Canada in 1996, up from 277,000 in 1995. Three provinces, Ontario, Quebec and Alberta, accounted for 72 per cent of this total.

A recent report done for the Department estimates the total number of heavy trucks registered in Canada in 1997, by registered weight class, from information compiled by R. L. Polk, combined with data collected directly from registration agencies in the Provinces and territories. The estimates are shown in Table 14-9.

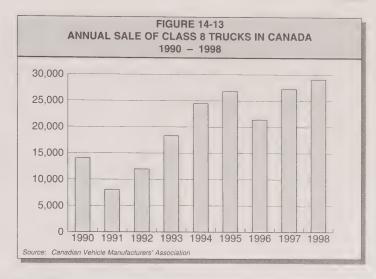


TABLE 14-8 SALES OF CLASS 8 BY PROVINCE 1997 and 1998						
1997 1998						
Commodities	Sales	% of Total	Sales	% of Total		
British Columbia Alberta Saskatchewan Manitoba Ontario Quebec New Brunswick Nova Scotia Prince Edward Island Newfoundland	1,315	19.0 4.8 5.5 35.9 19.3 4.2 1.7	1,168	15.1 4.0 5.6 41.1 19.5 4.4 1.9 0.2		
Canada	27,223	100.0	29,096	100.0		
Source: Canadian Vehicle Manufactur	rers' Association					

COMMERCIAL TRUCKS REGISTERED IN CANADA IN 1997							
Truck Class	3	4	5	6	7	8	Total
Gross min. weight (kg) max.	4,536 6,350	6,351 7,257	7,258 8,845	8,846 11,793	11,794 14,969	14,970 63,500	
Newfoundland Prince Edward Island Nova Scotia New Brunswick Quebec Ontario Manitoba Saskatchewan Alberta British Columbia Yukon Northwest Territories	863 292 1,791 14,609 20,322 23,333 5,500 58,673 32,174 8,608 242 191	172 95 488 585 7,252 7,252 584 1,288 25,762 2,726 75 60	120 86 253 228 4,009 5,047 796 2,262 7,975 1,811 47	1,135 1,134 2,064 2,569 20,410 20,445 6,385 19,045 8,657 7,184 296 233	1,647 619 2,550 2,117 15,504 16,053 10,000 4,185 23,589 7,693 312 204	3,432 2,220 7,871 12,121 57,904 90,429 17,314 15,667 63,728 29,388 1,240 813	7,369 4,446 15,017 32,229 125,401 162,559 40,579 101,120 161,885 57,410 2,212 1,538
Canada	166,598	46,339	22,671	89,557	84,473	302,127	711,765
Source: Fred Nix: "Comm	ercial Vehic	le Program	Thresholds'	report to To	C Rd Safety	, May 24, 19	198

TABLE 14 0

### TRANSPORTATION OF GRAIN BY TRUCK

A 1997 study sponsored by the Motor Carrier Policy Branch of Transport Canada, Review of Grain Transportation by Truck in Western Canada, noted recent increases in grain transportation by truck as the Prairie grain industry adjusts to significant changes. These changes include:

- · elimination of rail transportation subsidies,
- · consolidation of grain elevator and rail branchline services, and
- · expansion of secondary processing.

As a result of these changes, the use of trucks to haul grain within Western Canada has increased. In the 1995 – 1996 crop year, a total of 48.0 million metric tonnes of grain was available for sale. Approximately 43.5 million metric tonnes, or 90.5 per cent of this total, was trucked locally. Local trucking includes the following types of trucking:

- from a farm to a nearby primary elevator or inland terminal;
- · to a rail siding for loading in a "producer railcar";
- · for a local seeding requirement; or
- · for local feeding to animals.

More secondary processing activity in western Canada and active access to US markets has enabled the for-hire grain trucking industry to enjoy significant growth in intermediate trucking activity. As a follow-up to the 1997 study, the Study of Grain Transportation Changes and Outlooks for western Canada—1998 examines the extent and nature of grain-related agricultural processing activities in western Canada and quantifies their expected effect on trucking. This report describes trucking-related activities in terms of the underlying business segments they serve to give a better understanding of the factors that give rise to changes in the trucking sector (e.g. elevator consolidation, change of vehicle configuration, length of haul).

The 1998 report investigated such key sectors as milling and oilseed crushing, alcohol distilling, the malting of barley, animal feeding and meat processing, potatoes and other agro-industrial activities.

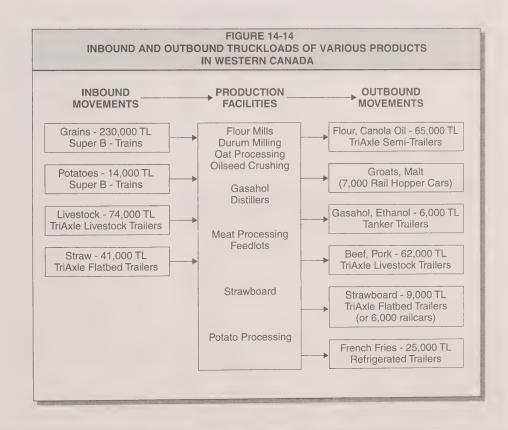
An estimated 8.4 million metric tonnes of grain is trucked in support of the various secondary processing facilities. Current grain volumes, converted to Super B-Train equivalents (tractor-twin-trailer units) result in 195,000 truckloads of grain being transported. Plant expansions and new facilities are expected to add an additional 1.4 million metric tonnes, or 33,000 truckloads, of grain per year over the next two to three years.

In addition to grain, the 1998 report also identifies other agricultural processing movements by truck (e.g. livestock hauling, refrigerated van trailer hauling of meats). These truck movements account for 205,000 truckloads per year; an additional 90,000 truckloads are expected when new facilities come into production. Several key factors underlie this growth in trucking in western Canada. The following summary of factors to affect truck movements includes both current and projected (over next two to three years) production levels:

- Consolidation of elevators (from about 2,000 to 760) has increased the average distance of farm to elevator
  movement of grain from 9 to 26 kilometres. Producers are increasingly using large trucks (such as Super
  B-Trains) rather than single-axle farm trucks for grain movements.
- Oat processing capacity has tripled since 1987, largely due to oats being recognized as a health food in the late 1980s. Specialty milling, which involves a number of smaller, specialized grain milling facilities, is increasing
- Canola is the principal oilseed crushed. Since 1987, capacity has tripled through modernization and expansion
  of existing plants. Some 2.5 million tonnes (57,900 truckloads) of canola are shipped to the crushing mills. The
  plants produce 1 million tonnes (41,100 truckloads) of oil and margarine by-products and an additional
  1.5 million tonnes of meal, which is trucked locally to feedlots located near the plants.
- There has been a general shift toward trucking for inbound feed stocks and outbound shipping of bulk alcohol products from distilling facilities.
- Two new plants in Alberta dominate beef production in western Canada. Approximately 3 million tonnes (69,500 truckloads) of grain is shipped to feedlots per year, and an additional 39,600 truckloads of cattle are moved between the feedlots and the meat packaging facilities. Outbound meat products are moved primarily in tri-axle semi-trailer refrigerated units, accounting for 33,000 truckloads per year.

- Since 1995, there have been several major plant expansions for processing pork. Approximately 27,600 truckloads of feed grain are delivered to the large commercial hog barns. This will increase to 39,500 truckloads after 1999. An additional 34,000 truckloads of hogs are moved from the farms to processing plants. Outbound pork products are moved primarily by truck, and represent 20,000 truckloads per year. This will increase to 28,700 truckloads after the Brandon plant becomes fully operational in 1999.
- Irrigation capacity in southern Alberta and Manitoba has expanded the acreage available for producing potatoes.
   A number of plant expansions and new facilities are under way, principally oriented to the production of french fry potatoes. Inbound movement of potatoes amounts to 7,400 truckloads, which will nearly double to 14,300 truckloads when future production is realized in the year 2000. Current outbound movement of potato products amounts to 13,200 truckloads and is expected to increase to 25,400 truckloads by 2000.
- The use of straw from cereal grain production to create strawboard as a building material is expanding. A pilot
  plant was opened in Manitoba in 1997, and there is a proposed facility in Alberta. If this technology is shown to
  be economically viable, other projects are expected to follow. Each plant is expected to process 300,000 tonnes
  (20,400 truckloads) of straw annually.
- Biotechnology research for new products is expanding. Manufacture of critical industrial products from grains
  will result in future markets for grains and further truck transportation support activities. University-based centres
  of excellence in biotechnology and agricultural engineering research have emerged in Saskatoon, Edmonton
  and Winnipeg.

Figure 14-14 shows the number of inbound and outbound truckloads of various products in Western Canada.



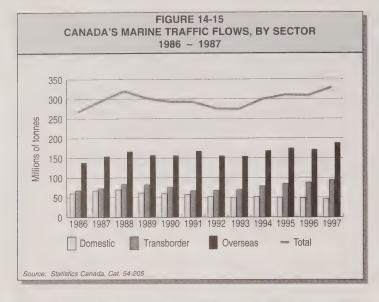


TABLE 14-10 CANADIAN FLAG SHARE OF CANADIAN WATERBORNE TRADE 1997							
Canadian Waterborne Trade	Canadian Flag	(mil Per cent	ions of to US Flag	nnes) Per cent	Foreign Flag	Per cent	Total Traffic
Domestic	45.5	97.4	0.2	0.4	1.0	2.2	46.7
Canada / US Deep-Sea	49.9 0.2	52.9 0.1	7.0 1.5	7.4 0.8	37.5 186.9	39.7 99.1	94.4 188.6
TOTAL	95.6	29.0	8.7	2.6	225.4	68.4	329.7
Source: Statistics Canad	a and Transport	Canada					

MA	RINE DON	TABLE 14- IESTIC FLO 1997	·11 WS BY REG	SION		
(Millions of tonnes)						
Region of Origin (Loadings)		egion of Destin St. Lawrence	ation (Unloadin Great Lakes	gs) Pacific	All Regions	
Atlantic	3.6	2.1	0.4	· · ·	6.1	
St. Lawrence	1.2	5.5	4.9	-	11.6	
Great Lakes	0.2	8.0	8.8	-	17.0	
Pacific	-	-	-	12.0	12.0	
All Regions	5.0	15.6	14.1	12.0	46.7	
Source: Statistics Canada	, Cat. 54-205					

### MARITIME TRANSPORTATION

Canada's maritime freight traffic has three components - domestic flows,2 transborder trade with the US, and "other" international3 (overseas) traffic. In 1997, marine freight traffic totalled 329.7 million tonnes,4 a 6.7 per cent increase over 1996 levels. Domestic flows accounted for 46.7 million tonnes, a 4.3 per cent decline from the 48.8 million tonnes moved in 1996. Transborder traffic between Canada and the US totalled 94.4 million tonnes, a 6.7 per cent increase over 1996 volumes. Overseas traffic reached 188.6 million tonnes in 1997, a ten per cent increase.

For the ten-year period 1987 to 1997, total marine flows fluctuated from one year to the next but showed a slightly increasing trend overall. With the exception of the domestic sector, 1997 was a peak year for marine freight volumes. Total traffic volumes were 6.2 per cent higher than the peak level of 1995 (310 million tonnes), also surpassing the previous peak year volume of 1988 (320 million tonnes). Domestic traffic flows decreased from a peak of 70 million tonnes in 1988 to 46.7 million tonnes in 1997, a 33 per cent decline. Transborder (Canada-US) traffic in 1997 exceeded the previous high recorded in 1996 by almost seven per cent. Since 1987, transborder tonnages increased by 29 per cent. Overseas (other international) traffic recorded a very healthy growth of 22.6 per cent between 1987 and 1997. Overseas volumes were eight per cent higher in 1997 than in 1995.

- 2 Maritime traffic that originates from and is destined to a Canadian port; the concept of flows only counts traffic volume once as opposed to the concept of port loadings and unloadings, where, in the case of domestic traffic, the same volumes get counted twice.
- 3 Traffic to/from all foreign countries other than the United States
- 4 Based on traffic flows rather than tonnage handled at Canadian ports (domestic volumes are not double counted)

Figure 14-15 shows Canada's marine traffic flows, by sector, from 1986 to 1997.

Canadian maritime trade has three main components domestic, transborder (US) and deep-sea. In 1997, these movements totalled 329.7 million tonnes. Domestic trade, also called coasting trade, accounted for 46.7 million tonnes, of which Canadian flag vessels carried 45.5 million tonnes, or 97.4 per cent. Canadian flag vessels were also active in the transborder trade between Canada and the US, carrying 49.9 million tonnes, or 52.9 per cent of the total traffic. Total Canadian deep-sea trade (excluding Canada-US trades) was 188.6 million tonnes. Of this, only 0.1 per cent was carried by Canadian flag vessels.

Table 14-10 shows Canada's flag share of Canadian waterborne trade in 1997.

### **Domestic Freight Traffic**

Domestic cargo shipped from one Canadian port to another is handled twice by the port system (loadings and unloadings). In 1997, Canadian ports handled 93.4 million tonnes of domestic cargo, a record low in the coastal trades, following a 4.3 per cent decrease from 1996 volumes. Domestic marine cargo has been steadily decreasing since its peak in 1988, when ports handled 139.9 million tonnes. This decline is due partly to a change in the direction of Canada's international trade. In the 1980s, many commodities, such as grain, were carried as domestic cargo via the Great Lakes-St. Lawrence Seaway system and then transferred at Canada's eastern ports for shipment overseas. Currently, these commodities are increasingly being carried by rail to Canada's

western ports for shipment overseas.

Preliminary data for domestic tonnage handled over the first three quarters of 1998 indicate a two per cent decrease over the same period in 1997, from 66.4 million tonnes to 64.8 million tonnes.

Table 14-11 shows flows of domestic marine traffic by region in 1997.

The bulk of domestic traffic is concentrated in the Great Lakes/ St. Lawrence Seaway system. These ports handled 58.3 million tonnes (loadings and unloadings) in 1997, or 62.4 per cent of the total domestic tonnage. The Pacific region ranked second, handling 24.1 million tonnes, or 25.8 per cent of the total. The Atlantic region handled 11.1 million tonnes of domestic traffic.

Canadian ports along the Great Lakes enjoyed a 46.5 per cent increase in domestic wheat loadings, along with a 30 per cent increase in loadings of other nonmetal mineral products. These gains offset decreases in shipments of iron ore (21.8 per cent) and limestone (11.3 per cent).

Ports along the St. Lawrence experienced a 36.7 per cent drop in shipments of fuel oil and gas, as domestic shipments of these commodities are increasingly being moved by rail. Large declines in iron ore shipments also affected domestic loadings in this region.

In 1997, Pacific coast ports handled 4.8 million tonnes less cargo than in 1996. Shipments of forest products, down by 3.3 million tonnes from 1996, accounted for 70 per cent of this decrease. Declining volumes of other metallic minerals (-77.5 per cent), fuel oil and gasoline (-27.6 per cent) and limestone (-14.9 per cent) were the significant contributors to the decreased domestic traffic volumes in this region.

#### COASTING TRADE ACT

Foreign-registered ship activity in Canada's domestic marine shipping is governed by the Coasting Trade Act. The Act reserves the transportation of passengers, cargoes and marine-related activities in Canadian waters to Canadian-registered, duty paid ships. The Act extends this reservation to Canada's continental shelf for activities related to the exploration and exploitation of non-living natural resources. Waivers are permitted to foreign registered ships to enter Canada's coasting trade when no Canadian ship is available or capable of providing a particular service. Revenue Canada, through its regional custom's offices, carries out the administration and collection of duties associated with obtaining a coasting trade licence. Duty is payable per month at the rate of 1/120th of 25 per cent of the declared fair market value of the foreign ship while involved in a coasting trade activity. An exception to this is that as of January 1998, in accordance with the Canada-US Free Trade Agreement, duty is not payable on US registered ships. The Canadian Transportation Agency is tasked with determining whether or not a Canadian-registered, duty paid ship is available to perform a particular service. The enforcement of the Act remains the responsibility of the Minister of Transport.

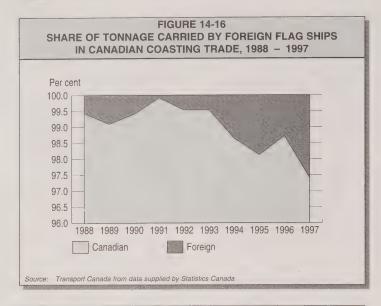


	TABLE 14-12			
<b>VALUE OF CANADA'S</b>	INTERNATIONAL	TRADE,	<b>MARINE</b>	<b>SHARE</b>
	1997			

	(\$ Billion)		
Transborder	Marine	All Modes	Marine's Share
Exports	6.7	245.1	2.7
Imports	2.8	183.9	1.5
Total US	9.5	429.0	2.2
Other Countries			
Exports	39.2	54.0	72.6
Imports	35.4	88.2	40.2
Total Other Countries	74.6	142.2	52.5

Note: For exports, mode of transport means the mode by which the international boundary is crossed. For imports, the mode of transport represents the last mode by which the cargo was transported to the port of clearance in Canada. This may not be the mode of transport by which the cargo arrived at the Canadian port of entry in the case of inland clearance. This led to some underestimation of Canadian imports by the marrine and air transport modes.

Source: Statistics Canada, Cat. 65-202 and 65-203; Special tabulations for total exports

Across Canada, the primary commodities handled in the domestic trade in 1997 were:

- wheat (14.2 million tonnes, up 46.4 per cent from 1996);
- pulpwood and chips (11.9 million tonnes, down 11.1 per cent);
- iron ore and concentrates (11.4 million tonnes, down 19.1 per cent);

- fuel oil (8.9 million tonnes, up 2.2 per cent); and
- logs, bolts and other wood (6.1 million tonnes, down 12.7 per cent).

These five commodities accounted for 56.2 per cent of all domestic tonnage handled at Canadian ports in 1997.

In 1997, 2.6 per cent of Canada's domestic marine shipping activities was handled by foreign ships. (See Coasting Trade Act text box for an explanation of the regulatory framework in place in Canada's domestic marine shipping.) Prior to 1997, the share of foreign ships in Canada's domestic shipping was always below two per cent of the total. While 1998 traffic information is not available, it is possible to report that during 1998, 100 applications for a coasting trade licence were received by Revenue Canada, down from the 106 in 1997. Of these, 84 were granted. The greatest proportion of the licences was granted to US flagged ships (37), followed by Panama (10) and Japan (6).

A number of coasting trade applications in 1998 were related to Canada's offshore oil and gas activity: the movement of products from Hibernia and Cohasset oil development fields, as well as activities associated with the exploration and development of the Sable Island gas fields. In 1998, 11 licences were granted for seismic research ships, operating mainly on the east coast.

Figure 14-16 indicates the actual tonnage and percentage of total cargo carried by foreign registered ships involved in Canadian domestic shipping from 1988 to 1997

### **International Freight Traffic**

In 1997, international marine traffic volumes totalled 283 million tonnes, an 8.8 per cent increase over 1996 levels. Of all the international tonnage handled at Canadian ports, 66.4 per cent are export-oriented (including intransit and re-export traffic).

According to international trade data, the value of Canadian international marine trade in 1997 was in the order of \$84.1 billion (excluding shipments via US ports). Marine exports were valued at \$45.9 billion and imports at \$38.2 billion. Total trade value was 1.3 per cent greater than in 1996. The value of exports increased by 4.3 per cent, while the value of imports decreased by two per cent.

Table 14-12 shows the value of marine share of Canada's international trade in 1997.

Canada's main deep-sea trading partners — Japan, China, South Korea, the United Kingdom and other western European nations – together accounted for over 61 per cent of total Canadian international marine trade (exports and imports) in 1997.

In terms of value of exports, Japan was Canada's primary trading partner in 1997, at \$10.3 billion. The US, at \$6.7 billion, ranked second.

Japan and the other Asia-Pacific Economic Cooperation (APEC) countries (excluding the US) accounted for 51.1 per cent of the total value of marine exports in 1997. If the US is included, then these countries accounted for over 43 per cent of the total.

For more detailed information on Canada's trade, see Chapter 9, Transportation and Trade.

Table 14-13 shows the value of Canadian exports by water according to main destinations in 1997.

Japan and the other APEC countries (not including the US) accounted for 40.3 per cent of the total value of marine imports in 1997. When the US is included, this block of nations accounts for 37.4 per cent of all of Canada's marine imports.

# TABLE 14-13 VALUE OF CANADIAN EXPORTS BY WATER, MAIN DESTINATIONS, 1997

Destinations	Value (\$ Million)	Share Percent
Japan and Other APEC' Japan South Korea China P. Rep. Taiwan Hong Kong Other	20,048 10,302 2,115 1,875 1,098 878 3,780	<b>51.1</b> 26.3 5.4 4.8 2.8 2.2 9.6
E.U. & Other Europe U.K. Germany Netherlands Italy Belgium Other	12,412 2,465 1,919 1,426 1,315 1,311 3,976	31.7 6.3 4.9 3.6 3.4 3.3 10.1
Other countries	6,754	17.2
Total Canadian Exports by water	39,214	100.0
1 Excluding the US; including domestic exports and re-exports  Source: Statistics Canada, Cat. 65-202 and Special Tabulation		

TABLE 14-14
VALUE OF CANADIAN IMPORTS BY WATER,
MAIN COUNTRIES OF ORIGIN, 1997

Origins	Value (\$ Million)	Share Percent
E.U. & Other Europe	15,115	42.7
Norway	2,940	8.3
Germany	2,814	7.9
U.K.	2,111	6.0
France	1,408	4.0
Italy	1,269	3.6
Other	4,573	12.9
Japan & Other APEC <sup>1</sup>	14,261	40.3
Japan	5,458	15.4
China, P. Rep.	3,142	8.9
South Korea	1,018	2.9
Taiwan	1,015	2.9
Australia	809	2.3
Other	2,819	8.0
Other countries	6,053	17.1
Total Canadian Imports by Water	35,429	100.0
4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		

1 Excluding the US

Source: Statistics Canada, Cat. 65-203

### SHIPPING CONFERENCES EXEMPTION ACT, 1987

The Shipping Conferences Exemption Act, 1987 (SCEA) allows shipping conferences to set ocean freight rates and services collectively. It also requires that the rates be published in a tariff filed with the Canadian Transportation Agency (CTA). To promote intra-conference competition and provide shippers with additional pricing options, the Act incorporates provisions for independent action on rates and for confidential service contracts. Further, it exempts shipping conference agreements from certain provisions of Canada's Competition Act and thereby allows liner shipping conferences to operate to and from Canada without fear of violating competition laws.

The Act provides for the Minister of Transport to designate a shippers group to represent the interests of shippers. The Canadian Shippers' Council (CSC) has been so designated. Under the Act, conferences are required to meet with the designated shippers group when requested to do so and are to provide information for the satisfactory conduct of a meeting. In 1998, the CSC met with most of the tariff filing conferences to discuss the conferences' proposed business plans, including rates, surcharges and ancillary charges.

TABLE 14-15	
CONFERENCE/NON-CONFERENCE SHARES OF CANADIAN	LINER
TRADE, 1994 - 1997	

(Millions of tonnes)							
	1994	1995	1996	1997			
Conference							
Exports	5.6	5.6	5.9	5.9			
Imports	5.0	4.4	4.7	4.3			
Total	10.6	10.0	10.6	10.2			
Non-conference							
Exports	5.3	6.5	6.8	6.5			
Imports	3.6	3.6	3.7	5.3			
Total	8.9	10.0	10.5	11.8			

TABLE 14-16 LINER TRAFFIC BY REGION 1997

(Millions of tonnes)					
	Lin	er Imports	Liner	Exports	
Region	Conference	Non-conference	Conference	Non-conference	Total
Europe	4.1	2.1	3.9	1.1	11.2
Asia	0.2	2.0	2.0	3.5	7.6
Central America	-	0.3	-	0.5	0.8
South America	-	0.4	-	0.3	0.7
North America	-	0.2	-	0.4	0.6
Middle East	-	0.1	0.0	0.5	0.5
Oceania	-	0.1	0.0	0.2	0.3
Africa	-	0.2	0.0	0.1	0.3
Total	4.3	5.3	5.9	6.5	22.0
- means "Nil"					

Table 14-14 shows the value of Canadian imports by water according to main countries of origin in 1997.

All of Canada's non-bulk oversea commodity trade is handled by liner shipping services. Canada's approach to international liner shipping has been to maintain a balance with Canada's major trading partners through the Shipping Conference Exemption Act (SCEA) (see Text Box on SCEA). The expectation is that Canadian shippers will have access to competitive, efficient and economic ocean liner shipping service options. With recent legislative developments affecting liner shipping in other parts of the world, consultations were initiated by the Department at the beginning of 1999 that invited stakeholders to submit their views on the Canadian liner conference legislation. (Such recent developments include changes to the US Shipping Act of 1984, which defines the regulatory framework for shipping conferences serving the US.)

### Conference/Non-conference Market Shares

Shipping lines offering scheduled liner services can operate either as a member line of a shipping conference or as an independent (non-conference) line. While non-conference traffic has grown consistently in recent years, conference traffic has declined somewhat. The decrease in conference traffic in 1997 was due largely to the dissolution of the Asia North America Eastbound Rate Agreement (ANERA) late in 1996. Thus in 1997, independent operators carried a larger share of both liner imports and exports than conference lines.

Source: Statistics Canada. International Database; and Transport Canada.

Table 14-15 compares the conference and non-conference shares of the Canadian liner trade from 1994 to 1997.

A breakdown of liner traffic by region is also useful to show the relative shares of conference and non-conference operators on different routes.

Table 14-16 compares conference and non-conference liner traffic by region in 1997.

Conference carriers tend to concentrate almost exclusively on containerized traffic with 10.1 million tonnes out of the total of 10.2 million tonnes they carried moving in containers. Non-conference traffic is also characterized by a large percentage of cargo in containers (70 per cent), but includes significant amounts of general cargo and neobulk traffic as well.

### **Transborder Freight Traffic**

Canada's marine traffic with the US increased by 29 per cent between 1987 and 1997, fueled by both exports and imports. In 1997, transborder traffic reached a peak of 94.4 million tonnes, up 6.7 per cent from 1996.

Preliminary data for the first three quarters of 1998 indicate that this upward trend is continuing. with transborder tonnage at 71.5 million tonnes compared with 65.5 million tonnes over the same period in 1997, a nine per cent increase. In 1997, exports<sup>5</sup> (loadings to US destinations<sup>5</sup>) led the growth in marine traffic between the two nations. In 1998, imports<sup>5</sup> (unloadings<sup>5</sup>) were the most dynamic, increasing 11.7 per cent to 28 million tonnes, compared with 25 million tonnes recorded over the same period in 1997.

**TABLE 14-17** CANADA'S MARITIME TRADE WITH THE US 1986 - 1997 (Millions of tonnes) Loaded Unloaded Total 1986 36.8 31.4 68.2 1987 39.8 33.5 73.3 1988 47.0 36.8 83.8 1989 43.4 39.3 82.7 1990 43.1 33.2 76.3 1991 36.8 30.2 67.0 1992 35.9 32.0 67.9 1993 42.1 27.8 69.9 1994 49.5 29.3 78.8 1995 49.9 85.2 1996 52.4 36.1 88.5 1997 56.9 37.5 94.4 Source: Statistics Canada, Cat. 54-205: Transport Canada

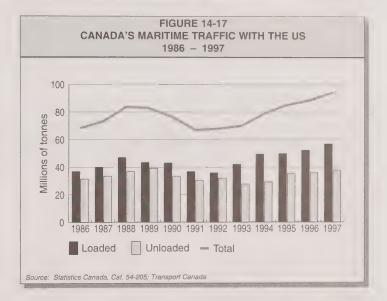


Table 14-17 shows Canada's maritime trade with the US from 1986 to 1987.

Figure 14-17 shows Canada's Maritime trade with the US from 1986 to 1997.

Marine traffic with the US was valued at \$9.5 billion in 1997, driven by exports of \$6.7 billion. This value, however, represented

only 2.2 per cent of total Canada—US trade. The bulk of the traffic was handled by surface transport modes, such as trucking and rail. For further details on the value of Canada's traffic with the US, see Chapter 9, Transportation and Trade.

<sup>5</sup> Including intransit and transshipment cargo.

TABLE 14-18 CANADA'S MARITIME TRAFFIC TO THE U.S. 1997				
Canadian Pagina	,	of tonnes) Region of Destina	tion	
Canadian Region of Origin		US Great Lakes		Total
Atlantic	24.5	0.0	0.1	24.6
St. Lawrence	6.2	6.6	0.0	12.8
Great Lakes	0.0	11.3	0.0	11.3
Pacific	0.8	0.0	7.4	8.2
Total	31.5	17.9	7.5	56.9
Source: Statistics Canada, Cat. 54-205; Transport Canada				

TABLE 14-19 CANADA'S MARITIME TRAFFIC FROM THE US 1997				
(Millions of tonnes)				
	US Region of Origir	7		
US Atlantic	US Great Lakes	US Pacific	Total	
2.3	0.3	0.0	2.6	
3.3	3.2	0.4	6.9	
0.1	24.2	0.0	24.3	
0.2	0.0	3.5	3.7	
5.9	27.7	3.9	37.5	
	'S MARITIME 19 (Millions US Atlantic 2.3 3.3 0.1 0.2	**S MARITIME TRAFFIC FROM 1997  (Millions of tonnes)  US Region of Origin  US Atlantic US Great Lakes  2.3 0.3  3.3 3.2  0.1 24.2  0.2 0.0	**S MARITIME TRAFFIC FROM THE US 1997  (Millions of tonnes)	

TABLE 14-20 CANADA'S MARITIME OVERSEAS TRADE 1986 – 1997				
	(Millions of to	nnes)		
	Loaded	Unloaded	Total	
1987	119.2	34.6	153.8	
1988	124.1	42.1	166.2	
1989	115.7	41.0	156.7	
1990	116.0	40.1	156.1	
1991	131.3	35.9	167.2	
1992	118.0	37.3	155.3	
1993	110.4	43.8	154.2	
1994	120.5	47.6	168.1	
1995	126.6	47.9	174.5	
1996	121.9	49.7	171.6	
1997	131.1	57.5	188.6	
Source: Statistics Canada, Cat. 54-205; Transport Canada				

### Exports

In 1997, loadings at Canadian ports destined to the US were 57 million tonnes, up 8.6 per cent from 1996. Seven commodities accounted for 75 per cent of marine export volumes. They included (in million tonnes): iron ore (10.7), crude petroleum (8.0), gypsum (6.2), stone and limestone (5.1), fuel oil (5.1), gasoline (4.0), and salt (3.5).

There were significant fluctuations in the amounts of major commodities exported to the US in 1997 (compared with 1996). Volumes of crude oil exports jumped by 162 per cent. Exports of iron ore and fuel oil decreased by 2.8 and 2.0 per cent, respectively. Gasoline and salt shipments were stable, while exports of gypsum and stone and limestone increased by 13 per cent.

There were two main flow corridors in 1997: the Canadian Atlantic to the US Atlantic route with 24.4 million tonnes (42.9 per cent of total loadings to the US) and the Canadian Great Lakes to US Great Lakes route with 11.3 million tonnes (20 per cent of total loadings).

Table 14-18 details traffic flows from Canada to the US in 1997.

### **Imports**

Unloadings at Canadian ports originating in the US rose from 36.1 million tonnes in 1996 to 37.4 million tonnes in 1997, a 3.8 per cent increase. Significant commodities, in terms of volume, included (in million tonnes): coal (13.7), iron ore (6.5), stone and limestone (3.1), fuel oil (2.4), other petroleum products (1.6) and alumina and bauxite (1.0). Together, these six commodities accounted for 75.5 per cent of all marine imports from the US.

As with exports, there was considerable instability in the volumes of marine imports from the US compared with 1996 volumes. Imports of coal and fuel oil were up 18.1 and 26.3 per cent, respectively. Stone and limestone showed a nine per cent drop. Volumes of iron ore and other petroleum products also increased by 3.2 and 2.6 per cent, respectively. Shipments of alumina and bauxite were relatively stable at -0.6 per cent.

The bulk of all marine imports from the US, just under 65 per cent of the total volume, originated at ports located along the US Great Lakes area. Ports along the US Atlantic and Gulf accounted for 15.7 per cent, with US Pacific ports making up the remainder of 10.4 per cent.

Table 14-19 shows the traffic flow from the US to Canadian ports in 1997.

### **Overseas Freight Traffic**

In 1997, Canadian marine trade with overseas countries (excluding Canada–US trade) totalled 188.6 million tonnes, up 8.1 per cent from the 1995 peak of 174.5 million tonnes. This trade has been strongly export-oriented, with the loading share oscillating between 70 and 79 per cent over the last 10 years. Over 62 per cent of total loadings to overseas countries took place at west coast ports. In contrast, over 90 per cent of overseas imports were unloaded at Canada's eastern ports.

Table 14-20 shows Canada's maritime overseas trade from 1986 to 1997

Preliminary data for the first three-quarters of 1998 indicate a three per cent decrease in tonnage handled in the Canada-overseas marine trades over the same period

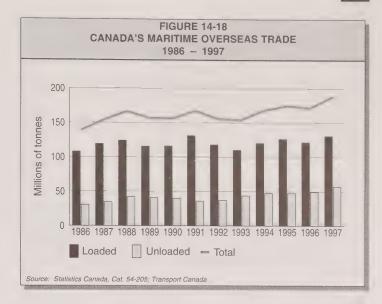


TABLE 14-21 CANADA'S MARITIME TRAFFIC TO OVERSEAS 1997				
	(Millions of tonne	es)		
Foreign Region	Canadian Re	gion of Origin		
of Destination	Eastern ports	Western ports	Total	
Asia and Oceania	6.5	57.2	63.7	
Europe	30.6	9.1	39.7	
South and Central America	6.4	8.1	14.5	
Middle East and Africa 5.7 7.4 13.2				
Total	49.3	81.8	131.1	
Note: Table may not add up due to rounding.				
Source: Statistics Canada, Cat. 54-205; Transport Canada				

in 1997. Loadings show a 7.1 per cent decline in volumes, largely due to the economic crisis that unfolded in many Pacific Rim and other Asian countries. This crisis resulted in depressed demand in Asia for Canadian bulk commodities such as grain, coal, iron ore and potash. Unloadings indicate a five per cent increase over 1997 volumes.

Figure 14-18 shows Canada's maritime overseas trade from 1986 to 1997.

In 1997, the Canadian marine trade with overseas countries

(excluding Canada–US trade) was valued at \$74.6 billion, with exports estimated at \$39.2 billion and imports at \$35.4 billion.

Marine transport was the dominant mode for shipping overseas freight, accounting for 52.5 per cent (value basis) of all overseas trade.

For more detailed information concerning Canada's offshore trade, see Chapter 9, Transportation and Trade.

### TABLE 14-22 CANADA'S MARITIME TRAFFIC FROM OVERSEAS 1997

(Millions of tonnes)				
Canadian Region	n of Destination			
Eastern ports	Western ports	Total		
25.8	0.3	26.1		
12.8	1.1	14.0		
10.8	1.0	11.7		
2.9	2.8	5.7		
52.3	5.2	57.5		
	Canadian Region Eastern ports 25.8 12.8 10.8 2.9	Canadian Region of Destination Eastern ports Western ports 25.8 0.3 12.8 1.1 10.8 1.0 2.9 2.8		

Note: Table may not add up due to rounding.

Source: Statistics Canada, Cat. 54-205; Transport Canada

# TABLE 14-23 GOODS CARRIED BY CANADIAN AIR CARRIERS BY SECTOR, 1993 – 1997

(Tonnes)				
	·	,	Other	
Year	Domestic	Transborder	International	Total
1997	513,719	77,387	222,452	813,558
1996	447,313	80,389	195,584	723,286
1995	416,171	87,663	183,743	687,577
1994	443,601	70,882	169,102	683,585
1993	422,147	68,238	163,108	653,493

Note: For 1995 to 1997, Levels I-III cariers: for 1993 and 1994, Levels I-IV carriers.

Source: Statistics Canada, Cat. # 51-206

### **Exports**

In 1997, Canadian marine loadings destined for countries other than the US generated 131.1 million tonnes of traffic, up more than 7 per cent from 1996 levels. Major commodities shipped from Canada included (in million tonnes): coal (35.7), iron ore (22.2), wheat (19.5), containerized freight (10.6), woodpulp (6.0), sulphur (5.5) and potash (5.4). Eight per cent of outbound loadings were containerized.

Some of the major commodities loaded in 1997 showed significant increases over 1996. Iron ore and wheat were both up 20 per cent. Containerized freight volumes increased by over 10 per cent,

potash and sulphur shipments were both up by 8 per cent, and coal shipments increased by 6.6 per cent.

In 1997, over 60 per cent of Canadian loadings for overseas destinations came from western Canadian ports, while ports along the Great Lakes–St. Lawrence Seaway system handled most of the eastern share. Predictably, the direction of trade was highly polarized, with the western ports dominating the Asia and Oceania trade routes, while the Eastern ports handled a high proportion of tonnage shipped to Europe.

Table 14-21 shows Canada's maritime traffic to overseas in 1997.

### **Imports**

In 1997, marine unloadings at Canadian ports from overseas origins reached 57.5 million tonnes, a resounding 15.7 per cent increase over the 49.7 million tonnes recorded in 1996. At 29.8 million tonnes (51.8 per cent of all tonnage unloaded from offshore origins), crude petroleum dominated imports6. Other major commodities unloaded included (in million tonnes): alumina/bauxite (5.2), containerized freight (7.8), iron and steel (2.9), fuel oil (1.6), iron ore (1.6) and gasoline (1.5). Well over 13 per cent of the inbound traffic was containerized.

Over 90 per cent of inbound overseas shipments were unloaded at eastern Canadian ports. The Europe and the Middle East-Africa regions were the principal origins of overseas cargo.

Table 14-22 shows Canada's maritime traffic from overseas markets in 1997.

### **AIR TRANSPORTATION**

### AIR CARGO

Domestic air cargo transportation is provided within a deregulated economic framework that does not restrict routing, capacity or pricing. Cargo is carried in the belly-hold of passenger aircraft, on passenger/cargo combination aircraft and in aircraft dedicated to cargo carriage (all-cargo). Scheduled and non-scheduled (charter) transborder and international air cargo carriage are offered within a framework of bilateral air agreements and international agreements as well as national policies. It is the

<sup>6</sup> Includes transshipment of North Sea crude petroleum.

prerogative of the Minister of Transport to designate the Canadian carriers that will exercise the international all-cargo rights which have been acquired by Canada through bilateral negotiations.

### Policy initiatives

In January, the Minister issued designation guidelines for scheduled all-cargo services that allowed for open all-cargo designations in international markets where Canada has open air rights or at least sufficient rights to satisfy foreseeable requests. Where Canada lacks sufficient rights to satisfy expressed demand, the guidelines specified that the federal government will, where consistent with its negotiating priorities and bilateral relationships, enter into air negotiations to seek those rights. Where sufficient additional rights can not be obtained, the government will seek to accommodate the interests of as many carriers as possible.

Two all-cargo designations were made under the new scheduled all cargo guidelines during 1998. In February, the Minister designated Kelowna Flightcraft International to provide all-cargo scheduled air services to the People's Republic of China. Kelowna Flightcraft International Air Cargo Ltd. doing business as Winniport operates air services for Winnipeg-based Winnport Logistics Limited, a company with expertise in transportation, electronic data interchange, finance, freight forwarding and customs. In August, Canada West Airlines of Calgary was selected to offer scheduled all-cargo services from Toronto to France and Germany. Canada West Airlines terminated business, however, during December 1998 without exercising its entitlement.

TABLE 14-24
OPERATING GOODS REVENUES OF CANADIAN AIR CARRIERS
BY SECTOR, 1993 - 1997

(\$ 000)					
Year	Domestic	International*	Total		
1997	660,799	357,301	1,018,100		
1996	655,271	350,461	1,005,732		
1995	694,247	292,272	986,519		
1994	562,694	296,384	859,078		
1993	588,835	224,876	813,711		

\* Includes transborder and other International.

Source: Statistics Canada, Cat. # 51-206

### TABLE 14-25 VALUE OF CANADIAN INTERNATIONAL TRADE'S AIR SHARE 1997

(\$ Billion)			
	Air	All Modes	Air (%)
Transborder			
Exports	12.2	245.1	5.0
Imports	16.8	183.9	9.1
Total US	29.0	429.0	6.8
Other Countries			
Exports	8.9	54.0	16.4
Imports	19.4	88.2	22.0
Total	28.3	142.2	19.9

Note: For exports, mode of transport means the mode by which the international boundary is crossed. For imports, the mode of transport represents the last mode by which the cargo was transported to the port of clearance in Canada. This may not be the mode of transport by which the cargo arrived at the Canadian port of entry in the case of inland clearance. This led to some underestimation of Canadian imports by the marrine and air transport modes.

Source: Statistics Canada, Cat. 65-202 and 65-203; Special tabulations for total exports

In May 1998, the Minister announced a new policy for international all-cargo charter air services. The new policy allows several shippers or charter services to charter space on an all-cargo aircraft. Freight forwarders are also allowed to act as charter services. This entitlement is a distinction from past policy, which had reserved multiple shipper and freight forwarder cargo for scheduled international air services. For a one-year period, the CTA will seek to ensure that all-cargo charter services do not impair the ability of Canadian carriers to maintain scheduled services.

#### Domestic Services

The domestic air cargo industry includes: passenger air carriers that carry cargo in their aircraft belly-hold for incremental revenue; all-cargo carriers; and freight forwarders and consolidators of shipments.

Table 14-23 shows the volume of goods carried by Canadian air carriers on all air cargo services, by sector from 1993 to 1997.

Table 14-24 shows the operating revenues generated by goods carried on Canadian air carriers on all air cargo services, by sector from 1993 to 1997.

TABLE 14-26 VALUE OF CANADIAN EXPORTS BY AIR BY MAIN DESTINATIONS, 1997			
Destinations	Value (\$ Million)	Air (%)	
Western Europe U.K. Germany France Switzerland Other	3,997 1,218 656 640 254 1,229	<b>45.1</b> 13.8 7.4 7.2 2.9 13.9	
Pacific Rim Hong Kong Japan Taiwan South Korea Other	<b>3,069</b> 749 520 415 355 1,030	34.7 8.5 5.9 4.7 4.0 11.6	
Other Countries  Total Canadian Exports by Air	1,788 8,854	20.2 100.0	
* Excluding the US; Including domestic exports and re  Source: Statistics Canada, Cat. 65-202 and Special			

TABLE 14-27 VALUE OF CANADIAN IMPORTS BY AIR MAIN COUNTRIES OF ORIGIN, 1997				
Origins	Value (\$ Million)	Air (%)		
Western Europe	9,745	50.2		
France	3,005	15.5		
U.K.	2,004	10.3		
Germany	1,233	6.3		
Italy	790	4.1		
Sweden	496	2.6		
Other	2,217	11.4		
Pacific Rim	6,910	35.6		
Japan	1,921	9.9		
Malaysia	930	4.8		
Taiwan	925	4.8		
South Korea	838	4.3		
China, P. Rep.	548	2.8		
Other	1,748	9.0		
Other Countries	2,763	14.2		
Total Canadian Imports by Air	19,418	100.0		
* Excluding the US				
Source: Statistics Canada, Cat. 65-203				

New services by air carriers in 1998 included Air Nova's introduction of a Dash-8 Combi aircraft into service in April. Unlike the 37-seat all-passenger configured Dash-8, the Dash-8 Combi has only 21 seats but can hold 4,000 kilograms of cargo. It was used on flights serving Labrador from St. John's, Newfoundland. Also in April, Knighthawk Express began flying for Federal Express between St. John's and Moncton, New Brunswick. ICC Canada, based in Farnham, Quebec, was granted a licence in November to operate domestic, all-cargo services.

Food security and nutrition continued to be major issues in isolated, northern communities. Under the Northern Air Stage, or "food mail," program, the Department of Indian Affairs and Northern Development provides funds to Canada Post for the cost of transporting food to isolated communities. This funding helps keep down the cost of food down for communities that rely on air transport and that lack year-round access by road, rail or boat. About 150 communities containing 90,000 people were eligible for assistance from the program, including isolated communities in Labrador, Quebec's Côte-Nord region, Northern Ontario, Manitoba, Saskatchewan, Alberta, the Northwest Territories and the Yukon.

### Canada-US Transborder Services

In 1997, air transport accounted for \$29 billion, or close to seven per cent of the \$429 billion total transborder trade. Of this, \$16.8 billion were imports and \$12.2 billion were exports. The top import commodities were telecommunications equipment (\$3.6 billion), electronic computers (\$3.0 billion), transportation equipment (\$2.4 billion), and other equipment (\$2.1 billion). The top export commodities carried by air were aircraft equipment (\$2.8 billion), office machine equipment (\$2.2 billion) and telecommunications equipment (\$2.0 billion). It should be noted that a significant portion of cargo moving on air waybills is actually trucked between Canada and the US.

Table 14-25 shows Canada's trade with the US carried by air for 1997.

Table 13-20 in the previous chapter showed the participation of Canadian air carriers in transborder courier operations.

Ontario dominated in terms of the provincial share of Canadian trade carried by air to the US, while Quebec and the western provinces ranked second and third.

In terms of activity by carriers during 1998, UPS opened a new handling facility in Hamilton in June. Five of its B727 fleet and an additional eight feeder services operate out of this facility.

ICC Canada began to operate a A300 freighter in transborder service (Vancouver-Calgary-Dayton, Ohio) for Emery Worldwide, a large US based courier operator

### **International Services**

In 1997, air transport carried 20 per cent of Canada's \$142 billion in trade with countries other than the United States (see Table 14-25). Of the total of \$28.3 billion carried by air, \$19.4 billion was accounted for by imports and \$8.9 billion was accounted for by exports. Ontario and Quebec dominate trade by air with other countries, with shares of 59 and 24 per cent.

The main destinations for Canada's exports by air to other countries were the Western European countries (\$4.0 billion) and the Pacific Rim countries (\$3.1 billion). Imports by air from other countries mainly originated in Western Europe (\$9.7 billion) and the Pacific Rim (\$6.9 billion).

Table 14-26 shows the value of Canadian exports by air, by main destination, for 1997.

Table 14-27 shows the value of Canadian imports by air, by main countries of origin, for 1997

In terms of carrier activity, there were several notable events during 1998. In March, Air Canada and Emirates Airlines cooperated to introduce a Toronto-Dubai air cargo service via London (Heathrow), U.K. This service caters especially to the oil industry. In April, Winniport/Kelowna Flightcraft Interational Air Cargo Ltd. doing business as Winniport began three times weekly service with a leased B747 between Winnipeg and the Chinese cities of Nanjing and Shenzhen. This service was temporarily suspended in early 1999.

# Passenger Transportation

Most recent passenger traffic information showed increases in all public transport services.

Two chapters have already reported some passenger-related transport activities: the chapter on Transportation and Tourism and the one on Transportation Infrastructure. This chapter deals with passenger transportation from a modal perspective. Unlike the Tourism chapter, the focus here is solely on the level of activities of each modal transport service.

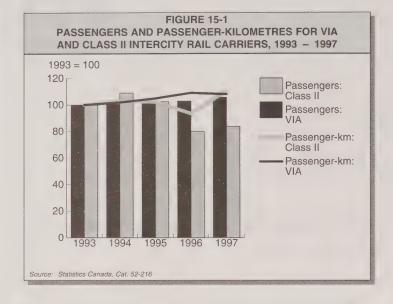
The means of travel most used by Canadians has to be the automobile as alluded to in the Tourism chapter. The coverage of this particular means of travel is severely limited by shortage of information. Nevertheless some information on the vehicles is presented to give a sense of its importance, as limited as this indicator may be.

For public passenger services, a modal service overview of passenger traffic provides a sense for the relative use made of the different modes, and reflects the recent trends. The overview of the most recent traffic information for each mode is complemented, when possible, by some information on recent "service" changes of relevance to explain traffic volume evolution and by some regional breakdown. The information presented gives a sense of the roles of the modes but does not address traffic from an intermodal or multimodal perspective.

Data limitations constrained the analysis. This modal analysis of passenger traffic helps to understand the findings presented in the last chapter of the report on Price, Productivity and Financial Performance in the Transportation Sector.

### **RAIL TRANSPORTATION**

In 1997, intercity passenger traffic increased by one per cent, with just over 4.1 million revenue passengers using services provided by VIA Rail and Class II carriers. Passenger-kilometres decreased marginally to 1.515 million from 1.519 million in 1996.



#### **TABLE 15-1** SCHEDULED INTERCITY BUS SERVICE CORRIDORS Corridor Carrier Halifax - Moncton - Quebec City SMT Quebec City - Montreal Orleans Montreal - Toronto Trentway Toronto - Windsor Greyhound Ottawa - Toronto Grevhound Greyhound; Trentway Toronto - Niagara Falls Toronto - Barrie PMCL; GO; ONTC Toronto - North Bay ONTC; Northern Air Toronto - Sudbury - Sault Ste. Marie - Winnipeg Grevhound Calgary - Edmonton Greyhound; PWT

In 1997, 92 per cent of all intercity rail passengers travelled by VIA Rail. VIA Rail carried close to 3.8 million passengers, up 2.7 per cent over 1996 numbers. At the same time, however, VIA Rail's total passenger-kilometres fell slightly to 1.423 billion.

Source: Motor Coach Canada, August 1998

Calgary - Vancouver

VIA Rail operates four passenger services: the Quebec-Windsor corridor, western transcontinental service (between Toronto and Vancouver), eastern transcontinental service (Montreal–Halifax and Montreal–Gaspé) and northern services (in Quebec, Ontario, Saskatchewan and British Columbia). The Quebec-Windsor corridor accounts for a slightly increasing proportion of VIA Rail's revenue passengers. An estimated 85 per cent of VIA Rail's passengers and 70 per cent of its trains travel in the corridor. VIA Rail's remaining passenger traffic is split nearly equally between its eastern and western routes.

Greyhound

In aggregate, passenger traffic on Class II railways (BC Rail, Algoma Central, Ontario Northland and Quebec, North Shore and Labrador Railways) increased from 323,000 in 1996 to 339,000 in 1997. Passengerkilometres also rose, from 77.1 million to 91.1 million. Most of the increase in traffic is attributable to BC Rail, although Ontario Northland also saw an increase in passengers volumes. Class II railways carried more than either of VIA's eastern and western routes in 1997.

From 1993 to 1997, VIA Rail traffic increased slightly, with an annualized growth rate of 1.3 per cent. Passenger traffic of other carriers declined at an annualized rate of 4.3 per cent in the same period.

Figure 15-1 shows the relative changes in passengers and passenger-kilometres for VIA Rail and Class II intercity carriers from 1993 to 1997.

### **BUS TRANSPORTATION**

### SCHEDULED INTERCITY BUS SERVICES

In 1997, 28 operators with annual revenues exceeding \$200,000 reported total annual operating revenues of \$303.7 million. Approximately 11.4 million passengers were carried on 1,125 motor coaches, school buses and other vehicles used in intercity scheduled bus service operations. Scheduled bus service operators used 100 main terminals and an additional 1,600 agencies for their operations.

In addition to intercity passenger services, scheduled intercity operators also provide charter bus services, school bus and other passenger bus service, as well as bus parcel express services. These other services generate a significant portion of the operators' revenues.

Greyhound is the dominant carrier in the major intercity corridors in Ontario and western Canada.

Table 15-1 lists the main corridors where scheduled intercity bus service is offered in Canada and the operator providing the service in those corridors.

Table 15-2 lists the number of intercity scheduled carriers and coaches, by province, for 1998.

From 1981 to 1997, the number of passengers using scheduled intercity bus services showed an overall decline. The number of passengers peaked in 1982 at 30 million, bottomed out in 1996 at 10.3 million, increasing to 11.3 million in 1997. This trend in passenger traffic is matched by a decline in the number of buskilometres recorded by scheduled carriers, from 196 million kilometres in 1982 to 118 million kilometres in 1997.

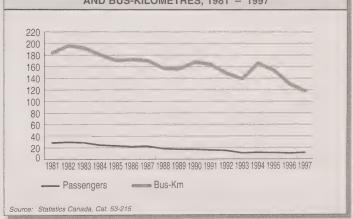
Figure 15-2 charts the trend in scheduled intercity bus services in terms of passengers and buskilometres from 1981 to 1997.

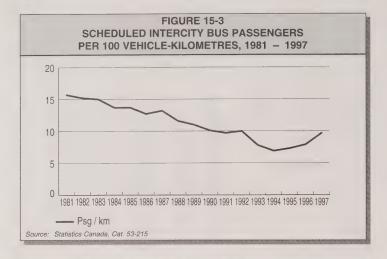
A good indication of average bus loads is the number of passengers per 100 vehiclekilometres. This indicator has declined from almost 16 passengers per 100 vehicle-km in 1981 to fewer than seven in 1994. Since 1994, however, the number has improved to almost ten by 1997.

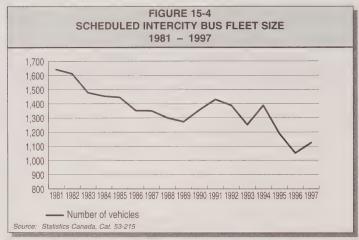
## TABLE 15-2 INTERCITY SCHEDULED BUS SERVICE CARRIERS BY PROVINCE

	Number of Carriers	Number of Coaches
British Columbia	10	151
Alberta	6	729
Saskatchewan	2	41
Manitoba	1	60
Ontario	14	628
Quebec	11	182
New Brunswick	1	71
Nova Scotia	4	35
Prince Edward Island	n/a	n/a
Newfoundland	3	22
Northwest Territories	1	4
Yukon	3	10
Canada	56	1,933
Source: Bus Industry Directory, 1999		

### FIGURE 15-2 SCHEDULED INTERCITY BUS PASSENGERS AND BUS-KILOMETRES, 1981 – 1997







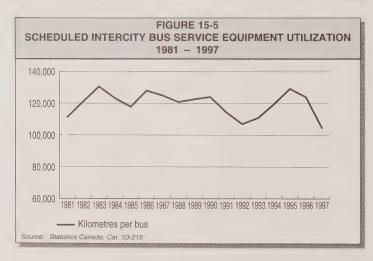


Figure 15-3 charts the overall decline in the number of passengers per 100 vehicle-kilometres on scheduled intercity buses from 1981 to 1997.

Except for 1990, 1991 and 1994, the number of buses operated by scheduled intercity carriers steadily declined since 1981.

Figure 15-4 shows the overall decline in the number of buses operated by scheduled intercity carriers from 1981 to 1997.

Vehicle use, as measured by kilometres per unit of equipment operated, has declined over the past 2 years to a low of 104 thousand kilometres per bus in 1997.

Figure 15-5 shows the fluctuating pattern in equipment utilization levels from 1981 to 1997.

### CHARTER BUS SERVICES

As stated in the Industry
Structure chapter, a charter service
is defined as a group trip where all
passengers embark and disembark
at the same point. An operator of
charter bus services is generally
granted the right to operate trips
out of a given location or city, but
has no constraints on destinations.
The operator also has the
flexibility to offer a broad range of
services (e.g. half-day school trip,
three-week excursion, one-way
trips, local sightseeing tours).

In 1997, 115 operators with revenues exceeding \$200,000 reported total annual operating revenues of \$290 million. Data on the number of passengers carried is not collected, but 2,700 vehicles travelled a total of 160 million kilometres.

The data published by Statistics Canada on the equipment operated

by charter carriers shows that fleet size declined steadily from 1981 to 1988, stabilized between 1988 and 1990, and has generally increased ever since. The number of buses in charter operations was at its highest level ever in 1996.

Figure 15-6 shows the size of Canada's charter bus fleet from 1981 to 1997.

Charter bus operations in the 1990s has been quite different from operations in the 1980s. As the number of vehicles dedicated to charter services decreased in the 1980s, the average use made of each vehicle (in thousands of kilometres travelled per vehicle) increased. In the 1990s, with one or two exceptions, the number of vehicles used in charter services increased each year, with a corresponding decline in utilization levels.

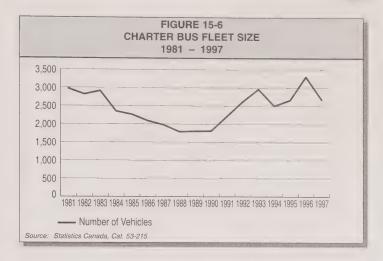
Figure 15-7 charts the use made of charter buses, in thousand kilometres per bus, from 1981 to 1997.

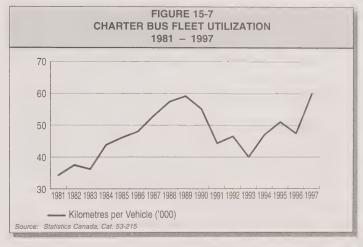
The expansion in charter business is also indicated by the increase in annual bus-kilometres. Since 1986, bus-kilometres have increased by 63 per cent for charter services and by 55 per cent for other services provided by charter operators.

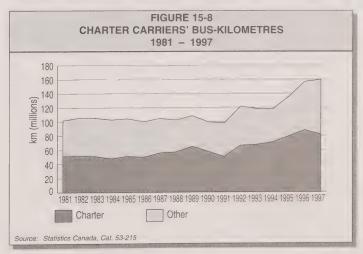
Figure 15-8 charts the number of bus-kilometres travelled by charter and other bus carriers from 1981 to 1997.

### URBAN TRANSIT BUS SERVICES

When it comes to urban transit services, the number of vehicles and the utilization rate have remained fairly stable during the 1990s, with the number of vehicles in the 13,000 to 13,500 range and a utilization rate in the range of







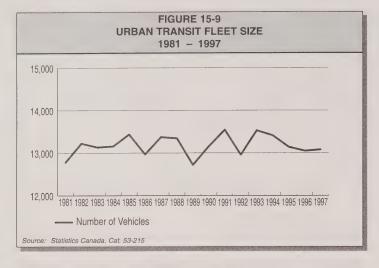


TABLE 15-3 URBAN TRANSIT FLEET COMPOSITION 1991 - 1997									
1991 1992 1993 1994 1995 1996 1997									
Number of carriers reporting	65	74	74	84	80	77	65		
Standard motor bus Low floor bus Trolley coach Articulated bus Light rail vehicle Heavy rail vehicle Commuter rail vehicle Other	10,474 332 458 527 1,379	9,757 135 358 364 500 1,735	145 308	10,085 188 344 359 547 1,381 331 176	306 548	287 520	9,030 1,019 322 287 520 1,381 336 182		
Total vehicles	13,542	12,956	13,527	13,411	13,140	13,049	13,077		
Source: Statistics Canada, Cat. 53-2	Source: Statistics Canada, Cat. 53-215								



55,000 to 58,000 kilometres per vehicle.

Figure 15-9 shows the number of buses in Canada's urban fleet from 1981 to 1997.

Since 1993, the number of vehicles used in urban transit services has been slowly declining. In addition, the composition of the fleet has changed over the past five years, with significantly lower numbers of standard motor coaches in operation. Low-floor buses are being introduced into services and articulated buses are being gradually removed.

Table 15-3 shows the make-up of Canada's urban transit fleet by category from 1991 to 1997.

The number of passengers using urban transit has remained fairly constant since 1994 after the decline experienced in the early 1990's. The average yearly distance travelled by all vehicles in urban transit operations remained almost unchanged between 1989 and 1994, but declined in 1995 and 1996.

Figure 15-10 shows the trend in urban transit in terms of number of passengers and vehicle-kilometres from 1981 to 1997.

The number of passengers per 100 vehicle-kilometres is a good indicator of average bus load. This number has steadily declined from a high of 244 in 1983 to 169 in 1996.

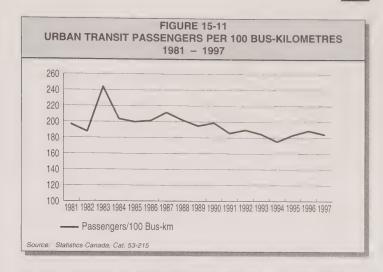
Figure 15-11 shows the number of urban transit passengers per 100 bus-kilometres from 1981 to 1997.

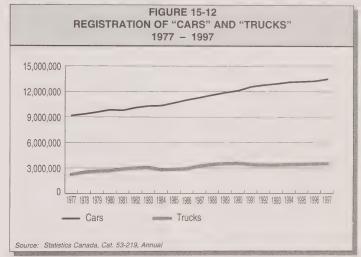
### AUTOMOBILE TRANSPORTATION

The extent of private vehicle activity in Canada has unfortunately not been monitored by any routine survey, and only fragmentary information exists to show its development over time. Some of that evidence is reviewed in what follows.

The firmest of the available indicators are the numbers of vehicles registered, compiled annually and published by Statistics Canada from reports from provinces and territories, each of which is responsible for the licensing of vehicles and regulation of their use. Registration statistics are available annually from the earliest days of motor vehicle use, in the first decade of this century. Trends in the period 1977 to 1997 in the main classes of vehicles reported are illustrated in Figures 15-12 and 15-13.

Figure 15-12 shows vehicles reported by each jurisdiction as "cars" and "trucks", using distinctions between those two classes of vehicles that are unfortunately somewhat obscure, and probably have changed substantially over time. The figure shows the number of "cars" rising from 9,554,000 in 1977 to 13,487,000 in 1997, while the number of "trucks" rose from 2,442,000 to 3,527,000 over the same period. The major source of uncertainty lies in the distinction between a "car" and a "light truck", and particularly in how passenger vans and "multi-purpose vehicles" are classified by the reporting jurisdictions. It seems likely that pickup trucks and vans designed to carry freight are usually classified as "trucks", but





it is also the case that vehicle manufacturers designate other passenger vans and multi-purpose vehicles as "light trucks" for the application of safety and emissions regulations, and the licensing jurisdiction might classify such vehicles either as "cars" or as "trucks" depending on their local conventions. It is not therefore clear that the "car" numbers reported by Statistics Canada, and shown in Figure 15-12, include all those vehicles designed primarily to carry passengers. And as the

numbers of passenger vans and multi-purpose vehicles sold has risen fast in recent years, the reported statistics for cars probably represent a declining proportion of the true numbers of vehicles designed primarily to carry passengers.

Then the statistics reported for "trucks" include a great variety of vehicles, ranging from small vans and multi-purpose vehicles designed entirely to carry passengers, classified as "trucks"

### TABLE 15-4 NATIONAL PRIVATE VEHICLE USE SURVEY RESULTS FOR Q4 OF 1995 TO Q3 OF 1996

1120	CETO TOTT Q TOT TO	700 10 Q0 0. 100	, ,
Туре	Number of Vehicles (millions)	Kilometres Travelled (millions)	Average Km/Vehicle
"Car" "Light truck"	10,408 3,986	177,886 69,576	17,092 17,457
Sum	14,393	247,462	17,193
Source Fremble, Lotter	STATPLUS "Enquête sur ut :	sation des venicules privés	1994-1996. Résultats

sommaires l'ecomito Natura Resources Canada 1999

due to the technicality mentioned above, through pick-up trucks that are similar in size to cars, to all of the larger freight-carrying vehicles, up to truck tractors used in hauling the largest combinations of trailers. Within these reported registration statistics, there is no distinction between trucks used for commercial or business purposes and those used only for the personal transportation of the owner; or even any simple distinction between trucks of different sizes or carrying capacities. A practical distinction exists in the federal safety standards between "light-duty" and "heavy-duty" trucks, with the latter having a Gross Vehicle Weight Rating of at least 4,536 kg. This is conventionally used to distinguish what might called "true" trucks - vehicles used exclusively for carrying freight - from the various forms of light trucks. The statistics provided as Table 14-9 in the Freight Transportation Chapter follow this definition of a heavy truck, and report that there were an estimated 712,000 such vehicles in 1997. By contrast, Figure 15-12 as noted shows that Statistics Canada reported a total of 3,527,000 "trucks" registered in that year. If both figures are accurate, the

remaining 2,815,000 registered "trucks" were light trucks. As we have observed, some of those were in fact private vehicles used exclusively for private passenger transport; and of the remainder, it is likely that the great majority are used predominantly for private passenger purposes, with occasional use to haul personal property; and that only a small proportion is used primarily for commercial or business purposes.

Some of the uncertainty can now be resolved through the results of the "National Private Vehicle Use Survey" (NAPVUS), undertaken by Statistics Canada for Natural Resources Canada from the fourth quarter of 1994 to the third quarter of 1996, results of which have been recently released.1 The survey identified vehicles available for personal use - i.e. not used exclusively for business purposes within a sample of households, then obtained short-period logs of usage and fuel purchases for sampled vehicles. This allows estimates to be made for the first time in recent years<sup>2</sup> of the number of vehicles used for personal transportation; and the extent of their use. Summary results for the last 12 months of the survey, from the fourth quarter of 1995 to the

third quarter of 1996, are shown in Table 15-4.

The survey suggests a total of nearly 14.4 million vehicles were used at least partially for private purposes in that year, and travelled a total of some 247 billion vehicle-kilometres, on an average of approximately 17,200 kilometres per vehicle. The table also indicates that the average was slightly greater for light trucks, at about 17,500 kilometres per vehicle, than for cars, at 17,100 kilometres.

The classification of vehicles into "car" and "light truck" in the survey was based on the vehicle type reported by the respondents, with the former category including only "2-door passenger car (including hatchback)", "4-door passenger car (including hatchback)" and "station wagon"; while all "mini vans" and "pickups" were allocated to "light trucks", together with "full-size vans" and "other trucks". By comparison, the Statistics Canada registration figures for the whole of 1996 record 13.251 million cars but only 3.476 million trucks. If it can be inferred from the numbers quoted above for heavy trucks in 1997 that they numbered approximately 700,000 in 1996, the number of light trucks registered in 1996 was only about 2.8 million. Clearly the definition of light truck being applied in NAPVUS must include a large number of vehicles classified as "cars" in the registration statistics, particularly as some of the "light trucks" in the registration statistics would have been used exclusively for business purposes, and thus not have been reported in NAPVUS. Overall from the two sets of

<sup>1</sup> See Tremblay, Victor, STATPLUS: "Enquête sur l'utilisation des véhicules privés: 1994-1996. Résultats sommaires", report to Natural Resources Canada, 1999.

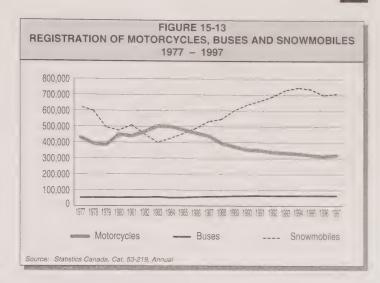
<sup>2</sup> Since the Fuel Consumption Surveys, undertaken by Statistics Canada for Transport Canada between 1979 and 1988, but following a different sampling methodology, and apparently identifying a smaller proportion of total registered vehicles as "available for private use".

numbers (assuming both sets are accurate) it can be inferred that the difference between the total of about 16 million cars and light trucks from the registration statistics and some 14.4 million such vehicles in NAPVUS – i.e. about 1.6 million vehicles – were either cars or light trucks used exclusively for business purposes.

Figure 15-13 provides statistics for 1977 to 1997 for the other classes of vehicles distinguishable within the registration reports to Statistics Canada. The number of buses identified increased from approximately 51,500 to 64,300, without substantial fluctuations. On the other hand, the numbers of motorcycles and snowmobiles can be seen to have varied significantly over this period. The number of motorcycles peaked at 502,000 in 1983, but subsequently declined to only 319,000 in 1997. Meanwhile the number of snowmobiles fell by more than one-third between 1977 and 1983, to some 400,000, but has since increased to some 707,000 in 1997.

### FUTURE DATA IMPROVEMENT

The absence of routine data on road vehicle use is finally to be remedied by the new Canadian Vehicle Survey, initiated by Statistics Canada under contract to Transport Canada in January 1999. The survey obtains 7-day trip logs from owners of vehicles sampled continuously from official registration records. This will allow annual estimates to be made of vehicle-kilometres for the entire road vehicle fleet, including trucks and buses, and their distributions by characteristics of the vehicles, the drivers, and the trips. The first such annual estimates, for calendar 1999, are expected to be available in the summer of 2000.



### MARINE TRANSPORTATION

### CRUISE SHIP TRAFFIC

In 1998, international cruise ship traffic was up at all of Canada's major ports, with Vancouver leading the field at over 873,000 passengers embarked/ disembarked. The 1998 season represents the 16th consecutive year of growth for Alaska cruises, with a 7 per cent increase (although this was not as high as the 17 per cent growth in 1997). This continuous growth has moved the Vancouver- Alaska market up to the third most popular cruise region in the world, behind the Caribbean and Europe.

Halifax, Nova Scotia, and Saint John, New Brunswick, enjoyed increased visits by cruise vessels, while other Atlantic ports also welcomed international cruise passengers in 1998. Cape Breton, Nova Scotia, enjoyed an excellent cruise season, with an estimated 25,000 passengers coming ashore at Sydney, Baddeck and Louisbourg. Corner Brook,

Newfoundland, also welcomed 7,538 passengers in 1998, up from less than 3,000 in 1997. Charlottetown, P.E.I., is hoping to see increased vessel calls in 1999 now that the rules for vessels transitting under the Confederation Bridge have been clarified. Charlottetown recorded visits by only 2,115 passengers in 1998, well below the levels of earlier years and dramatically down from a high of 18,083 passengers in 1991.

Table 15-5 shows the cruise ship traffic at major Canadian ports from 1990 to 1998.

Official totals for passenger trips in domestic cruise operations are not available. The Canadian Passenger Vessel Association represents many of the larger operators. Its annual survey for 1998 indicated that 5.66 million passengers used its members' services during the year. The Association des Croisieres-Excursions du Quebec last surveyed its members in 1996, when they carried 909,000 passengers.

TABLE 15-5
CRUISE SHIP TRAFFIC AT MAJOR CANADIAN PORTS
1990 - 1998

		(Passeng	ers)		
Year	Vancouver	Montreal	Quebec City	Halifax	Saint John
1990	388,323	30,869	34,783	24,423	1,748
1991	423,928	47,047	51,363	43,512	3,402
1992	449,239	34,872	41,141	30,112	5,500
1993	519,942	30,626	38,642	30,917	12,379
1994	591,409	33,920	36,401	37,717	23,629
1995	596,744	27,384	38,981	30,257	12,226
1996	701,547	19,078	21,464	36,584	8,543
1997	816,537	29,324	36,569	44,328	19,813
1998 (prel.)	873,102	32,583	45,000	47,798	28,418
Source: Local Port 0	Corporations				

### FERRY TRAFFIC

Figures for 1998 for all members of the Canadian Ferry Operators Association (CFOA) are not yet available. The relative size of their operations is evident, however, in the traffic figures for 1997. British Columbia Ferry Corporation, by far the largest operator in Canada, carried approximately 22.3 million passengers and 8.2 million vehicles. Ferry services operated by British Columbia's Ministry of Transportation and Highways carried 5.2 million passengers and 2.2 million vehicles. La Société des traversiers du Ouébec carried 5.1 million passengers and 1.8 million vehicles, while Marine Atlantic carried about 1 million passengers and 0.5 million vehicles in 1997. The remaining CFOA members accounted for 4.6 million passengers and 1.7 million vehicles crossings.

### **AIR TRANSPORTATION**

### AIR TRANSPORT SERVICES

Domestic air passenger transportation is provided within a deregulated economic framework that has no limits on routing, capacity or pricing. International schedule passenger services continue to be offered within a framework of bilateral air agreements between Canada and over 60 foreign countries. It is the prerogative of the Minister of Transport to designate which Canadian carriers will exercise the route rights that have been acquired by Canada in these agreements. Each year Canada negotiates and puts into effect new and amended route rights in response to the requests of Canadian carriers and foreign governments.

#### **Government Policy Initiatives**

On April 1, 1998, the Minister announced a review of Canada's 1978 policy on international passenger charter air services. While the review is underway, the October 1997 proposal of the Canadian Transportation Agency (CTA) to amend the Air Transportation regulations that give effect to the existing policy has been suspended. As part of the policy review, extensive consultations were held with interested industry stakeholders, including scheduled and charter air carriers, tour operators and travel agents.

On December 1, 1998, Canada and the US announced an agreement on implementing intransit pre-clearance services in Canada. Under this initiative, all Canadian airports with existing US pre-clearance facilities became eligible for intransit pre-clearance services. Intransit pre-clearance is currently in place as a pilot project at Vancouver International Airport and allows arriving international passengers to proceed directly to US Customs without having to first go through Canada Customs. A Bill (S-22) was introduced into Parliament that defines the authorities for US Customs and Immigration officers in preclearance areas in Canadian airports and ensures travellers' rights under Canadian law. (US officials will apply US laws relating to entry into the US, but all Canadian criminal laws and the Canadian Charter of Rights and Freedoms will continue to apply.) The US government undertook to amend its law to fully reciprocate Canada's proposed legislation. As a result of these initiatives, installation of in-transit pre-clearance facilities will become possible in airports at Toronto (Pearson) and Montreal (Dorval) in 1999, at Calgary in 2001, and at Edmonton, Winnipeg and Ottawa after 2001.

On December 10, a Bill (S-23) to amend the *Carriage by Air Act* was introduced into Parliament to give Canada the authority to ratify and implement two key

international aviation agreements. the Guadalajara Convention and Montreal Protocol No. 4. These two agreements are part of the Warsaw System of international conventions and protocols related to liability insurance coverage for the carriage by air of passengers, baggage and cargo. The Guadalajara Convention extends the application of the international liability regime to passengers (baggage and cargo) travelling on a carrier other than the one from which they purchased travel as a result of code-sharing or where another carrier has been contracted to operate on its behalf. Montreal Protocol No. 4 amends the liability regime for cargo with stricter liability and maximum limits. It also simplifies the requirements for cargo documentation and allows for its transmission electronically.

Also in 1998, the CTA ordered Canadian Airlines, Air Canada and Air Nova to improve their services for passengers with disabilities by: enhancing the identification of accessible seating; improving the handling of wheelchairs, complete with repair and replacement procedures; and providing better information on specific check-in procedures to these passengers. Further work by the CTA in this regard led to the publication of Taking Charge of the Air Travel Experience: A Guide for Passengers with Disabilities.

#### Bilateral Initiatives<sup>3</sup>

On June 2, 1998, the Minister replied to international route

requests from Air Canada and Canadian Airlines. Specifically, the Minister announced that the federal government would seek, through bilateral negotiations, rights for a daily Toronto–Hong Kong service for Air Canada and for a daily Vancouver–Osaka service for Canadian Airlines.

In his June 2 announcement, the Minister also recognized the growing strategic importance of commercial alliances4 within the industry. In response to increasing global competition, the Minister also announced that new codesharing<sup>5</sup> opportunities would be provided for Air Canada and Canadian Airlines. Each carrier was permitted to name up to five new country markets for codesharing, subject to specific conditions and implementation procedures. Three of these conditions are worth noting: Air Canada's selections in South America and the Pacific region would be limited to Brazil. Thailand and New Zealand: some routing constraints were imposed on any Air Canada code-sharing services to New Zealand and Thailand; and, during the first year, all such rights would have to be exercised via an intermediate country. Air Canada selected New Zealand, Mexico, Brazil, the Netherlands and Thailand as its code-sharing destinations. Canadian Airlines selected Belgium, Switzerland, Sweden, Jamaica and South Korea. At year end, the necessary rights had been obtained from New Zealand. Mexico, the Netherlands and

Thailand (February 1999), in addition to the rights from Sweden and Belgium, which were already available.

In 1998, at Air Canada's request, an examination of the Canada-Taiwan market was made to determine whether the threshold of 300,000 one-way scheduled passengers a year as stipulated under Canada's Second-Carrier Designation Policy was exceeded. If it were, the entry of a second Canadian carrier would be permitted. In his June 2 announcement, the Minister denied Air Canada's request to be designated as the second carrier because he had concluded that the threshold had not yet been reached. He did, however, note the rate of growth of that market and indicated that the department would undertake to review the situation later in the year. On January 4, 1999, the Minister announced that the threshold had been reached and that he was designating Air Canada to operate three times a week to Taiwan.

In March, the Minister announced a successful conclusion to ground handling arrangements at Keflavik Airport, Iceland. This was further to consultations with Iceland held in August 1997, when Icelandair was given the right to operate a third weekly flight to Halifax and/or Montreal. That right was granted on the condition that Icelandair and Canada 3000 Airlines could agree on a ground handling arrangement at Keflavik Airport. As a result of the new arrangement, Icelandair added the

<sup>3</sup> During international bilateral negotiations, the interests of both countries are addressed, and understandings on the cities that can be served, the number of carriers that may operate, the flight frequency and the type of aircraft to be used are recorded to form a bilateral air transportation agreement.

<sup>4</sup> See Table 13-7 in Chapter 13, Industry Structure.

<sup>5</sup> Code-sharing is the ability to sell air transportation under one airline's name on the flights of another airline. In the international context, code-sharing allows carriers to sell transportation on the network of services of code-share partners as if it was their own. In addition, by coordinating their marketing efforts, alliance partners can provide a combined product to the consumer, including one-stop check-in, better coordinated connections, and priority baggage transfer.

### TABLE 15-6 CHANGES IN AIR CANADA'S WESTERN ROUTES

Air Canada transferred the following routes to Air BC:

Calgary - Saskatoon

Calgary - Regina

Winnipeg - Saskatoon

Winnipeg - Regina

Winnipeg - Thunder Bay

Air BC transferred the following routes to Central Mountain Air:

Vancouver - Kamloops

Vancouver - Campbell River

Vancouver - Comox

Calgary - Kamloops

Calgary - Grande Prairie

#### Joint Air Canada/Air BC Services:

Vancouver - Calgary

Vancouver - Quesnel

Vancouver - Williams Lake

Vancouver - Prince George

### Certain Non-Stop Routes now routed through Vancouver or Calgary:

Edmonton - Victoria

Edmonton - Regina

Edmonton - Kelowna

Kelowna - Victoria

Victoria - Seattle

Source: Åir Canada

third flight to Halifax, and in May, Canada 3000 Airlines introduced weekly charter services from Calgary and Vancouver to Keflavik and beyond to Europe.

On August 7, the Minister designated Air Canada to provide service between Canada and Lebanon. The carrier selection was precipitated by a request from the Government of Lebanon for bilateral air negotiations. Air Canada's designation sets the stage for the first scheduled air service by a Canadian carrier between Canada and Lebanon, Air Canada was selected to provide code-sharing service to Beirut via Frankfurt with Lufthansa (three times per week) and via London with Middle East Airlines (five times per week). Canada's negotiations with Lebanon in November 1998 were successful. although no new service by the

designated carrier on either side is expected in the near term.

Also on August 7, the Minister designated Canadian Airlines to serve the Canada—Chile market. Canadian Airlines proposed to provide code-sharing service via intermediate points in the US, where it would connect with the flights of LAN Chile and other partner airlines onward to Santiago.

On September 1, enhancements to the bilateral air services agreement with New Zealand were achieved. The new agreement grants Canadian Airlines the right to code-share with Air Pacific to New Zealand via Honolulu, and for Air Canada to code-share with its alliance partners, Air New Zealand and United Airlines. Under the new agreement, the designated airlines for each

country are able to offer codeshared services between all cities in Canada and all cities in New Zealand. New rights for ownaircraft services have also been agreed to, which will permit the doubling of the airline capacity between the two countries.

On November 26, a codesharing agreement with Mexico that allows for dual designation was achieved. This agreement secured rights to allow both Air Canada and Canadian Airlines to code-share to and from Mexico with Mexican designated airlines and other alliance partners. The agreement features the right for two designated airlines of each country to code-share with the designated airlines of the other country, as well as airlines of a third country. In addition, the agreement sets no limitations on the number of seats sold or the number of flights used for codesharing, or where carriers can connect for code-sharing globally. Finally, it allows access to all cities in each other's territory for code-sharing. There are also plans to continue negotiations with Mexico in 1999 to conclude a more liberal agreement for ownequipment services.

On December 7, the Minister signed Canada's first bilateral air services agreement with the Republic of Hungary to bring it into legal effect. Air Canada initiated scheduled air services by code-sharing on the flights of its airline alliance partner, Lufthansa, between Frankfurt and Budapest in the summer of 1998, on an extrabilateral basis pending signature of the agreement. When Malev Hungarian Airlines decides to enter the direct scheduled air services market, it will have the right to serve up to five cities in Canada with a combination of its

own aircraft services and codesharing services.

### Service Disruption – The Air Canada Pilots' Strike

Air Canada's scheduled air services were suspended for 13 days in early September when its pilots went on strike. The airline used the services of other carriers primarily to bring its passengers abroad back to Canada. Air Canada's regional subsidiaries, Air BC, Air Ontario, Air Alliance and Air Nova, were not affected and continued to operate their normal scheduled services. Domestically, there was some traffic diversion to other Canadian carriers, which in some cases operated higher frequencies and additional services. For example, Canadian Airlines added up to 20 additional flights per day to accommodate increased demand. WestJet also provided additional lift. It took Air Canada approximately one week after the strike ended to resume full operations. Shortly after resuming normal operations in mid-September, Air Canada initiated deep fare discounts for a limited period to regain business that was diverted to other carriers during the strike.

### DOMESTIC SERVICES AND TRAFFIC

After serving Winnipeg,
Manitoba, for two months during
1996, WestJet returned on March
20, 1998, to serve the city. With its
return to Winnipeg, WestJet
provided scheduled services to
major centres in B.C., Alberta,
Saskatchewan and Manitoba.
WestJet also operated to Grande
Prairie, Alberta, on a charter basis
from February 6 to June 21
inclusive. In 1998, WestJet secured
access to \$27 million US and later
signed agreements for delivery of

# TABLE 15-7 CITY PAIRS FOR DOMESTIC SCHEDULED AND CHARTER PASSENGER TRAFFIC

ı		Top Do	mestic Mark	cets, 1997		
	Rank 1997	City pair	Scheduled Passengers	Charter Passengers	Total Passengers	Charter Share %
ı	1	Montreal-Toronto	1,181,770	104,862	1,286,632	8.2
ı	2	Toronto-Vancouver	829,650	222,148	1,051,798	21.1
ı	3	Ottawa-Toronto	688,880	487	689,367	0.1
ı	4	Calgary-Vancouver	519,960	91,816	611,776	15.0
	5	Calgary-Toronto	495,020	78,583	573,603	13.7
Į	6	Toronto-Winnipeg	346,670	181,173	527,843	34.3
-	7	Edmonton-Vancouver	312,330	68,819	381,149	18.1
ĺ	8	Calgary-Edmonton	308,020	1,107	309,127	0.4
l	9	Halifax-Toronto	289,380	119,260	408,640	29.2
	10	Edmonton-Toronto	281,700	43,181	324,881	13.3
l	11	Montreal-Vancouver	193,590	91,601	285,191	32.1
	12	Ottawa-Vancouver	176,520	13,639	190,159	7.2
	13	Vancouver-Winnipeg	174,070	160,817	334,887	48.0
ĺ	14	Calgary-Winnipeg	157,440	125,749	283,189	44.4
	15	Prince George-Vancouver	146,650	558	147,208	0.4
	16	Thunder Bay-Toronto	138,290	1,975	140,265	1.4
	17	St John's-Toronto	127,540	50,039	177,579	28.2
į	18	Calgary-Montreal	125,370	10,872	136,242	8.0
	19	Kelowna-Vancouver	112,090		112,090	-
	20	Calgary-Ottawa	104,880	368	105,248	0.3

Note: Ranking is based on scheduled origin/destination traffic, excluding charter origin/destination traffic. Figures do not include passengers carried by WestJet Airlines and Vistajet.

Source: Statistics Canada - Cat. No. 51-204 & 51-207

seven B737-200 aircraft, two of which were delivered in late 1998. Two more are to be delivered in 1999 and the remaining three before the end of the year 2000.

In April, NorTerra Inc., an investment holding company for two major Inuit groups, the Inuvialuit Development Corporation of the western Arctic and the Nunasi Corporation of the eastern Arctic, created Air NorTerra and purchased the Canadian North division of Canadian Airlines to provide the service. Based in Yellowknife, Northwest Territories, Air NorTerra assumed responsibility for marketing and sales, while operations and maintenance are provided on contract by Canadian Airlines.

In August, Air Canada realigned its services out of Vancouver and Calgary with the objective of reducing capacity in western Canada to better match demand. It generally involved the transfer of some routes from Air Canada to Air BC and some routes from Air BC to Central Mountain Air. The changes allowed Air Canada to re-deploy nine aircraft (2 A320s, 1 A319 and 6 CRJs) from Western Canada to Central and Eastern Canada and to transborder services. At the same time, Air Canada added four DC-9s to its western network. The changes also allowed Air BC to retire one Dash-8 aircraft. The result was a reduction in the number of non-stop services and the increased use of Air Canada's partner, Central Mountain Air, which took over from Air BC routes suited to its fleet of 18-seat Beech 1900 D aircraft. These routes include Vancouver to Kamloops, Campbell River and

1989

1988

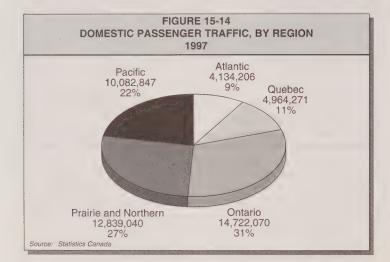
Source: Statistics Canada

DOMESTIC ENPLAN	TABLE 15-8 IED AND DEPLANED PASSENG 1988 – 1997	ER TRAFFIC
Year	000s	Per cent change
1997	50,482	8.0
1996	46,742	11.9
1995	41,778	5.0
1994	39,803	1.1
1993	39,353	-4.0
1992	40,999	0.2
1991	40,926	-10.2
1990	45.567	0.0

45.568

46,676

-2.4



Comox, and Calgary to Kamloops and Grande Prairie.

Table 15-6 outlines these changes.

On October 26, Inter-Canadien assumed the air services formerly operated by IMP Group subsidiary Air Atlantic and became the nation's largest regional air carrier east of Manitoba. Inter-Canadien, which was sold to Canadian Investor Corporation in August 1998, is a commercial partner in Canadian Airlines' network. Although Air Atlantic ceased operating on October 25, its parent, IMP Group, remained active with the acquisition in November of Toronto-based charter air carrier Air 500.

In November, two Air Canada subsidiaries, Air Nova and Air Alliance, announced a plan to consolidate and realign their respective operations by April 1999. The consolidation would combine and re-deploy the fleet, with Air Nova using the 37-seat Dash-8 and the 77-seat BAe-146, while Air Alliance would handle all services that used the 18-seat Beech 1900D. Air Nova would remain based in Halifax and Air Alliance would continue to be based in Quebec City. The headquarters of the combined operation would be in Halifax.

Canadian Airlines also initiated a code-sharing arrangement with Helijet on service between Vancouver and Victoria.

Preliminary statistics suggest that domestic passenger traffic in 1998 increased by 2.9 per cent from 1997.

Table 15-7 lists the top 20 city pairs for domestic scheduled and charter passenger traffic.

Table 15-8 shows the changes in domestic enplaned and deplaned passengers from 1988 to 1997.

Figure 15-14 shows the regional breakdown of domestic passenger traffic.

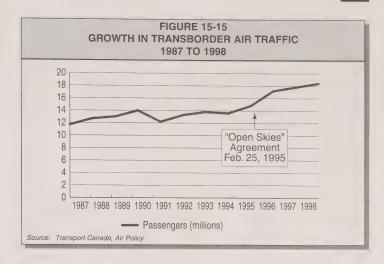
### Transborder Services and Traffic

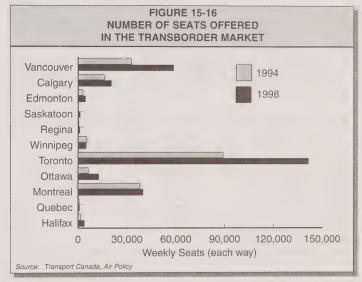
February 1998 marked the third anniversary of the 1995 Canada-US "Open Skies" Air Transport Agreement and with it, the removal of the last remaining restrictions limiting access to Toronto by US carriers. In 1998, Air Canada expanded or added new services to the US, including new non-stop services from Toronto (Pearson) to San Jose and New Orleans, from Montreal (Dorval) to Washington (Dulles) and from Ottawa to New York (LaGuardia). Canadian Airlines added new services between Toronto and Boston and between Vancouver and San Jose, California.

Fifteen of Canadian Airlines' transborder services were affected when its alliance partner, American Airlines, was forced to withdraw code shares on these services during the summer of 1998 to adhere to contractual terms with its pilots union. Codesharing on these services was re-instated on January 1, 1999.

There has been little change in the scope and scale of specialty service operations by Canadian and American entities based on the entitlements in the North American Free Trade Agreement (NAFTA). In 1998, there were 31 Canadian companies authorized to operate in the US and 24 American companies authorized to operate in Canada.

Figure 15-15 shows the growth in transborder air traffic over the





# TABLE 15-9 NEW DIRECT NON-STOP TRANSBORDER AIR SERVICES 1998

City	Route	Airline
Edmonton	Denver	Air Canada/Air BC
Halifax	New York/Newark	Continental Express
Kelowna	Seattle	Alaska/Horizon
Ottawa	New York/Newark	Continental Express
Ottawa	New York/LaGuardia	Air Canada
Toronto/City Centre	Syracuse	US Airways Express
Montreal/Dorval	Washington/Dulles	Air Canada
Vancouver	Palm Springs	Alaska
Vancouver	Seattle	United/Skywest
Vancouver	San Jose	Canadian Regional
Toronto	Boston	Canadian and Canadian Regional
Calgary	Houston	Continental
Toronto	Charlotte	US Airways Express
Toronto	New Orleans	Air Canada
Toronto	San Jose	Air Canada
Source: Transport Canad	la, Air Policy	

TABLE 15-10
PASSENGER TRAFFIC FOR SCHEDULED, REGIONAL
AND CHARTER OPERATIONS, CANADA - US, 1991 - 1997

Period	Canadian C	arriers	U.S. Car	All Carriers		
		Market		Market		% Annual
Period	Passengers	Share %	Passengers	Share %	Passengers	Change
1991	5,182,000	42.3	7,057,000	57.7	12,239,000	40-10
1992	5,619,000	42.2	7,688,000	57.8	13,307,000	8.7
1993	5,634,000	40.9	8,146,000	59.1	13,780,000	3.6
1994	5,908,000	43.3	7,735,000	56.7	13,643,000	-1.0
1995	6,482,000	43.7	8,367,000	56.3	14,849,000	8.8
1996	7,850,000	45.7	9,317,000	54.3	17,167,000	15.6
1997	8,772,000	49.4	8,992,000	50.6	17,764,000	3.5
Notes:	Evoludes nassenders	carried by no	-Canadian and non-	II S carriors		

Source: Aviation Statistics Centre, Statistics Canada, Statements 2, 4 and 6,

last 12 years. Figure 15-16 shows the increase in the number of seats offered in the transborder market since 1994.

Table 15-9 lists new direct non-stop air services in transborder markets.

Table 15-10 summarizes the passenger traffic for scheduled, regional and charter operations, as well as the market shares held by Canadian and US carriers.

See Appendices 15-1 and 15-2 for the entry, exit and ongoing activity in the Canada-US scheduled, regional and charter operations market by air carrier nationality and points served.

### INTERNATIONAL SERVICES AND TRAFFIC

Preliminary statistics indicate a 4.8 per cent increase in international passenger traffic in 1998 over 1997. In 1997, total traffic increased by 9.4 per cent over 1996 levels. These figures include same-plane services by scheduled, charter and regional carriers. They do not include passengers connecting to international air services in the US.

Table 15-11 shows international passenger traffic between Canada and countries other than the US from 1991 to 1997.

Appendix 15-3 lists the international air services provided to and from Canada as of the end of 1998. These include foreign markets served by Air Canada and Canadian Airlines, as well as Canadian markets served by foreign carriers. This appendix also provides a partial list of foreign markets served by Canada's charter air carriers. It shows that there are 34 countries currently receiving same-plane,

scheduled services from Canada. Canadian air carriers serve 25 of these countries.

An international airspace agreement allowing North Korean airspace to be used for overflights went into effect on April 23. This agreement will help reduce flight times between Asia and North America by up to 50 minutes. This in turn will reduce fuel and crew costs.

In anticipation of traffic growth in the international sector, Air Canada opted to augment its wide-body fleet by acquiring additional Airbus A330 and A340 aircraft to be delivered over the next four years.

Air Canada augmented its services with new and expanded code-sharing arrangements with Star Alliance partners United Airlines and Lufthansa, as well as with Air New Zealand, Royal Jordanian and Singapore International Airlines.

Canadian Airlines acquired an Airbus A320 and four B767-300ER long-range aircraft, two of which were delivered in late 1998. The two new aircraft permitted the carrier to increase frequencies on its long-haul routes and to replace the capacity lost when it retired two DC-10-30 aircraft.

On September 22, Canadian Airlines announced that it had joined as a founding member a new global airline alliance, oneworld. Like Star Alliance, the oneworld alliance expands the number of destinations and options to make air travel easier by creating a system combining the services of its carrier members. Some of the features of this alliance include an integrated international schedule, blended technology, common passenger

		NAL AIR PASSE LUDING US), 199		
Period	Atlantic	Pacific	Southern	Total
1991	4,776,000	1,000,000	2,222,000	7,998,00
1992	5,221,000	1,140,000	2,353,000	8,714,0
1993	5,345,000	1,288,000	2,444,000	9,077,0
1994	5,802,000	1,478,000	2,560,000	9,840,0
1995	6,147,000	1,760,000	2,614,000	10,521,0
1996	6,413,000	1,920,000	2,574,000	10,907,0
1997	6,762,000	2,289,000	2,884,000	11,935,0
		% Change		
1991-92	9.3	14.0	5.9	9.0
1992-93	2.4	13.0	3.9	4.2
1993-94	8.6	14.8	3.9	8.2
1994-95	6.0	19.1	3.0	7.2
1995-96	4.3	9.1	-1.5	3.7
1996-97	5.4	19.2	12.0	9.4

and baggage handling procedures, and reciprocal frequent flyer programs.

In 1998, eight Canadian air carriers (Air Canada, Air Transat, Canada 3000 Airlines, Canadian Airlines, First Air, Royal Airlines, Skyservice and WestJet) filed international charter programs with the Canadian Transportation Agency (CTA) to operate services for tour operators. Major destinations included points in Europe as well as "sunspot" areas, mainly in the southern US, Latin America and the Caribbean.

Air Canada and Skyservice provided charter flights for professional sports teams.

# APPENDIX 15-1 NUMBER OF TRANSBORDER SCHEDULED AIR SERVICES BY CARRIER NATIONALITY

	Op	Service: perated ruary 1	in	Pre- Service Since F		pended		ices Ad Since ruary 1			es Ope as of ember	erated 1998
Airport	Canada	US	Total	Canada	US	Total	Canada	US	Total	Canada	US	Total
Toronto/Pearson	14	23	37	1	11	12	29	12	41	42	24	66
Vancouver	6	10	16		5	5	8	16	24	14	21	35
Montreal/Dorval	7	10	17		3	3	4	5	9	11	12	23
Calgary	4	5	9	2	3	5	4	6	10	6	8	14
Ottawa	1	6	7		4	4	4	5	9	5	7	12
Halifax	2		2				1	2	3	3	2	5
Edmonton		3	3		1	1	1	1	2	1	3	4
Winnipeg	1	1	2							1	1	2
others	5	8	13	3	2	5		6	6	2	12	14
Sub-total	40	66	106	6	29	35	51	53	104	85	90	175
Charter conversions	30		30	22		22				8		8
Total	70	66	136	28	29	57	51	53	104	93	90	183

Source: Transport Canada, Air Policy

#### APPENDIX 15-2 STATUS OF TRANSBORDER SCHEDULED AIR SERVICES AS OF DECEMBER 31, 1998 Current Services New Services Current Services Pre-Agreement Services Suspended Subsequently Introduced After February 24, 1995 Operated Before Airport February 24, 1995 after February 24, 1995 Suspended Chicago: Air Canada Denver: Air Canada Dallas: American Calgary Chicago: American Chicago: Canadian\*\*\* Los Angeles: Air Canada Las Vegas: Canadian (C) Denver: Delta Los Angeles: Delta Salt Lake City: Delta Las Vegas: Delta Denver: United Palm Springs: Canadian (C) Houston: Air Canada San Francisco: Air Canada New York/Newark: Air Canada Houston: Continental Spokane: United Phoenix: Canadian (C) Los Angeles: Canadian Minneapolis: Northwest San Francisco: United Seattle: Alaska (R) Spokane: Air Canada (R) Denver: Air Canada (R) Minneapolis: Northwest Dallas: American Las Vegas: Canadian (C) Edmonton Intl. Seattle: Alaska (R) Salt Lake City: Delta Boston: Air Canada (R) Fredericton Boston: Canadian (R) Boston: Air Canada (R) Detroit: Northwest Halifax Boston: Delta (R) New York/Newark: Air Canada (R) Ft. Lauderdale: Canadian (C) New York/Kennedy: American (R) New York/Newark: Continental Orlando: Air Canada (C)\*\*\* Orlando: Canadian (C) St. Petersburg: Canadian (C) Tampa: Air Canada (C) Hamilton Pittsburgh: US Airways (R) Seattle: Alaska (R) Kelowna Minneapolis: Northwest (R)\*\*\* Kenora Detroit: Northwest (R) London Pittsburgh: US Airways (R) Boston: Air Canada (R) Moncton Boston: Delta (R) Montréal/Dorval Atlanta: Delta Boston: Air Canada Baltimore: US Airways Atlanta: Air Canada Ft. Lauderdale: Air Canada (C) Boston: Delta (R) Hartford: Delta (R) Dallas: American Hartford: Air Canada (R) Chicago: Air Canada Miami: Delta New York/Kennedy: Delta Miami: American Chicago: American Philadelphia: Air Canada (R) Washington/Dulles: ValuJet Cincinnati: Delta Minneapolis: Northwest New York/Kennedy: American (R) Detroit: Northwest Washington/National: US Airways Los Angeles: Air Canada New York/Newark: Continental Orlando: Air Canada (C) Miami: Air Canada San Francisco: Air Canada New York/LaGuardia: Air Canada Washington/Dulles: Air Canada New York/LaGuardia: Delta (R) Washington/National: Air Canada New York/Newark: Air Canada Philadelphia: US Airways Pittsburgh: US Airways Tampa: Air Canada\*\*\* Montréal/Mirabel Boston: Northwest (R) Ottawa Boston: Air Canada (R) Boston: Delta (R) Albany: Delta (R) New York/Kennedy: American (R) Chicago: Air Canada New York/Newark: Air Canada Baltimore: US Airways Orlando: Canadian (C) Chicago: American Pittsburgh: US Airways (R) New York/Kennedy: US Airways (R) St. Petersburg: Canadian (C) Detroit: Northwest (R) Syracuse: US Airways (R) New York/LaGuardia: Air Canada New York/LaGuardia: Delta (R) New York/Newark: Continental (R) Philadelphia: US Airways Washington/Dulles: Air Canada Québec New York/Kennedy: American (R) Boston: Delta (R) New York/Newark: Air Canada (R) Regina Minneapolis: Northwest (R) Minneapolis: Canadian (R) Saint John Boston: Canadian (R) New York/Newark: Air Canada (R) Boston: Delta (R) Minneapolis: Northwest Thunder Bay Minneapolis: Northwest (R) Toronto/Pearson Allentown: Air Canada (R) Baltimore: Air Canada (R) Albany: Delta(R) Cincinnati: Air Canada Atlanta: Air Canada Baltimore: US Airways (R) Boston: US Airways Dallas: Air Canada Boston: Air Canada Atlanta: Delta Cleveland: US Airways (R) Ft. Lauderdale: Canadian (C) Hartford: Delta (R) Boston: Canadian Chicago: Air Canada Ft. Myers: Canadian (C) Boston: Delta (R) Chicago: American Miami: Delta Indianapolis: Air Canada (R) Charlotte: Air Canada Chicago: United Nashville: American Nashville: Delta (R) Charlotte: US Airways (R) Cincinnati: Delta (R) Pittsburgh: Delta Saginaw: Midwest Express (R) Chicago: Canadian Cleveland: Air Canada Rochester: US Airways St. Petersburg: Canadian (C) Cleveland: Continental (R) Dallas: American Syracuse: Delta (R) Sarasota: Canadian (C) Tampa: American Tampa: Canadian Columbus: Air Canada (R) Dayton: US Airways (R) Tampa: Delta

Columbus: US Airways (R)

Detroit: Northwest

Washington/Dulles: Canadian (R)

Continued

Airport	Current Services Introduced After	Current Services	Pre-Agreement	New Services	
Airport	February 24, 1995	Operated Before February 24, 1995	Services Suspended after February 24, 1995	Subsequently Suspended	
Toronto/Pearson (contined)  Dallas: Canadian Derver: Air Canada Pt. Lauderdale: Air Canada (C)*** Ft. Myers: Air Canada (C)*** Harrisburg: Air Canada (R) Houston: Continental Kansas City: Air Canada (R) Houston: Continental Kansas City: Air Canada (C) Miami: American Miami: Canadian Milwaukee: Air Canada Milwaukee: Midwest Express Minneapolis: Air Canada Minneapolis: Northwest Nashville: Air Canada New York/LaGuardia: Canadian New York/LaGuardia: Canadian New York/LaGuardia: Canadian New York/LaGuardia: Canadian Philladelphia: Air Canada Phitsburgh: La Air Canada Phoenix: Air Canada Pittsburgh: Air Canada Pittsburgh: Air Canada Pittsburgh: Air Canada Paleigh: Air Canada Raleigh: Air Canada Raleigh: Canadian (R) Raleigh: Canadian Raleigh: Air Canada Rashington/Dulles: Air Canada Washington/Dulles: Air Canada Washington/National: Air Canada Washington/National: Air Canada West Palm Beach: Air Canada West Palm Beach: Air Canada		Grand Rapids: Midwest Express (R) Hartford: Air Canada (R) Honolulu: Canadian Houston: Air Canada Indianapolis: US Airways (R) Los Angeles: Air Canada New York/LaGuardia: Air Canada New York/LaGuardia: Air Canada New York/LaGuardia: American New York/LaGuardia: American New York/Newark: Air Canada Philadelphia: US Airways San Francisco: Air Canada San Francisco: United Tampa: Air Canada	Washington/Dulles: Delta (R)	Washington/National: US Airw West Palm Beach: Canadian	
Toronto/City Centre Vancouver	Syracuse: US Airways (R) Boston: Canadian Chicago: Canadian Dallas: American Dallas: American Dallas: Canadian Denver: United Detroit: Northwest*** Honolulu: Air Canada (C) Houston: Continental Kahului/Maui: Air Canada (C) Las Vegas: Alaska Las Vegas: Alaska Las Vegas: Canadian Los Angeles: United Minneapolis: Northwest New York/Kennedy: American Palm Springs: Alaska Phoenix: Canadian (R) Reno: Reno Air Salt Lake City: Delta (R) San Diego: Canadian San Francisco: Alaska San Francisco: United San Jose: Canadian (R)	Chicago: United Honolulu: Canadian Los Angeles: Canadian Porlland: Air Canada (R) Porlland: Delta (R) Porlland: Delta (R) San Francisco: Canadian Seattle: Air Canada (R) Seattle: Alaska (R) Seattle: Alaska (R) Seattle: United (R)	Bellingham: Alaska (R) Los Angeles: Delta San Francisco: Delta San Jose: American Spokane: Northwest	Atlanta: Delta Cincinnati: Delta Denver: Air Canada Las Vegas: America West Los Angeles: Air Canada Miami: American New York/Newark: Continental Palm Springs: Canadian (C) Reno: Canadian (C) San Diego: Alaska	
Victoria		Seattle: Alaska (R)	Port Angeles: Alaska (R)	Seattle: Air Canada (R)	
Whitehorse	Anchorage: Alaska (R)	Object Ale Committee		Chicago: American	
Winnipeg		Chicago: Air Canada Minneapolis. Northwest		Las Vegas: Canadian (C) Orlando: Air Canada (C) Palm Springs: Canadian (C)	

Notes: \*\*\* Seasonal Service
(R) Denotes services operated by regional affiliates
(C) Denotes charter services operated by Air Canada and Canadian Airlines before February 24, 1995

Source: Transport Canada, Air Policy

		ATIONAL AIR SEF	PENDIX 15-3 RVICES AS OF DECEMBER 31, 1998 S TRANSBORDER AIR SERVICES)	
	Foreign Points Served by C Air Canada	anadian Air Carriers Canadian Airlines	Canadian Points Served by Foreign Air Carriers	Major Charter Air Services
Atlantic	Delhi Frankfurt Glasgow London Manchester Paris Tel Aviv Zurich		Aeroflot: Montreal, Toronto Air France: Montreal, Toronto Air Ukraine: Toronto Alitalia: Toronto British Airways: Montreal, Toronto, Vancouver Czech Airlines: Montreal, Toronto El Al: Montreal, Toronto Iberia: Montreal Icelandair: Halifax KLM: Montreal, Toronto, Vancouver Lufthansa: Toronto, Vancouver Olympic: Montreal, Toronto Pakistan International: Toronto Royal Air Maroc: Montreal Sabena: Montreal Swissair: Montreal	Amsterdam Frankfurt Glasgow London Manchester Paris
Pacific	Hong Kong Osaka Seoul	Bangkok Beijing Hong Kong Manila Nagoya Taipei Tokyo	Air China: Vancouver Cathay Pacific: Toronto, Vancouver Japan Airlines: Vancouver Korean Air: Toronto, Vancouver Malaysia Airlines: Vancouver Mandarin: Vancouver Singapore Airlines: Vancouver	
Southern	Antigua Barbados Bermuda Fort-de-France Kingston Montego Bay Nassau Pointe-a-Pitre Port-au-Prince Port of Spain St. Lucia	Buenos Aires Mexico City Monterrey Sao Paulo	BWIA: Toronto Cubana: Montreal, Toronto LACSA: Toronto Mexicana: Montreal, Toronto VASP: Toronto	Acapulco Aruba Cancun Ixtapa Manzanillo Montego Bay Nassau Puerto Plata Puerto Vallarta Punta Cana Santo Domingo Varadero
Other	Air Transat: Paris First Air: Kangerlussuaq		Air St. Pierre: Halifax, Montreal, St. John's, Sydney Greenlandair: Iqaluit	

# PRICE, PRODUCTIVITY AND FINANCIAL PERFORMANCE IN THE TRANSPORTATION SECTOR

Strong productivity performance within the transportation sector has translated into cost savings that, in turn have been passed on to a significant extent to users through lower transport prices.

Transportation is strategically important to Canadian producers and consumers, and maintaining an efficient transportation system is a key national objective. Deregulation has improved efficiency in the past few years, effectively moving transportation firms into a market environment and ensuring that prices are determined by market forces rather than regulatory agencies.

This chapter reviews the performance of Canadian transport firms in terms of productivity, unit cost, prices and financial performance, first for the transport sector as a whole and then for each mode of transportation. More specifically, this chapter looks at the effects of changes in transportation prices; the relationship between carriers' prices and their input costs; the relationship between

productivity and input cost changes; the extent to which efficiency gains are transferred; and the net effect of these factors on carriers' financial returns.

The following sections review the individual performance of each transportation sector, provide highlights of the most recent year for which data is available, and review performance indicators over the short and medium terms.

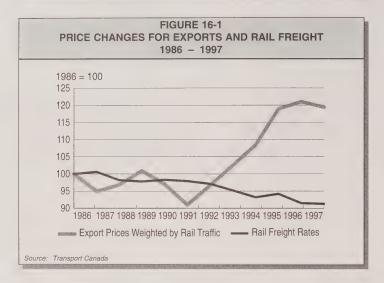
- Productivity expresses the efficient use of assets by relating physical measures of outputs to physical measures of inputs. Labour is the most commonly used productivity indicator, but it is only a partial measurement of productivity because it measures only one factor of production. Total factor productivity is a more accurate measure because it measures the efficiency of labour, capital and other inputs combined to produce goods and services.
- 2 Financial performance compares the value of outputs, such as revenues, to the cost of inputs. Market conditions influence financial performance, so a firm with dominant market power may show high rates of return, exhibited in high prices, despite low productivity. Conversely, a firm in a highly competitive market may have high productivity, but show modest rates of return because of falling prices.

### TABLE 16-1 PRICE AND OUTPUT CHANGES FOR CN AND CP RAIL 1995 - 1998

	1986/1997	1995	1996	1997	1998²
Price Changes (%) Output Changes (%)	(0.6) 1.4	1.1 (5.7)	(2.6) 3.0	(0.2) 10.4	(0.4) (3.9)

- 1 Average Annual Growth
- 2 Preliminary and based on three quarters of year

Source: Transport Canada



### RAIL INDUSTRY

### THE FREIGHT RAILWAY INDUSTRY

Total industry revenues from railway freight carriers in Canada reached a record \$7.5 billion in 1997. Canadian National (CN) and CP Railways together generated a total of \$6.8 billion, representing a 91 per cent market share. Other freight railways shared the remaining 9 per cent of the industry's total revenue.

In this section, the analysis of price, output, productivity and unit cost measures focuses on the performance of Canadian National and CP Rails' Canadian operations. The financial analysis also includes a brief discussion of the performance of regional and shortline railways.

### **Output and Price Changes**

Both CN and CP Rail achieved record output growth in 1997, with an average growth rate of ten per cent. Due to a period of stagnation in the early 1990s, however, output increased by an average annual rate of only 1.4 per cent from 1986 to 1997. Freight prices declined by a total

of six per cent during the same period, which was equivalent to a drop of 27 per cent in real terms.

Table 16-11 shows rail output and price changes at CN and CP Rail from 1995 to 1998.

During the first three-quarters of 1998, rail freight prices declined by 0.4 per cent and output dropped by 3.9 per cent, compared with the same period in 1997, largely due to declines in grain and other bulk commodity shipments.

Strong productivity gains have enabled railways to keep price increases below inflation rates, but market factors also played a role.

Figure 16-1 compares changes in rail shipper prices, represented by the price index of commodities exported by the rail mode,<sup>3</sup> with those in rail freight prices over the past decade.

Early trends show the pressure on rail freight rates from lower commodity prices. After 1991, when export prices picked up, rail freight rates continued to fall, indicating that shippers also benefited from strong productivity gains in the rail freight sector.

### **Cost and Productivity Indicators**

At one time, rail freight operations were far more labour intensive. In 1986, labour costs represented 43 per cent of the total cost of Class I freight railways, compared with an average of 39 per cent in the transportation sector as a whole. In 1997, the labour cost share in rail freight was reduced to 36 per cent, about the same as total transportation.

Figure 16-2 compares the cost structures of CN and CP Rail in 1986 and 1997.

<sup>3</sup> In order to reflect export prices of shippers using the rail mode, the export prices by commodity group were weighted by rail traffic to derive the aggregated export commodity price.

Labour productivity of Class I railways has more than doubled since 1986. Significant gains were achieved in 1997, as average labour productivity increased by 14.6 per cent. These gains are attributable to both strong output growth and workforce reductions.

Table 16-2 shows efficiency indicators at CN and CP Rail from 1986 to 1997.

CN and CP Rail have achieved these impressive results through workforce adjustments and some streamlining of their operations over the past decade. Since 1986, employment in their Canadian operations has fallen by 34,000 employees, a 47 per cent reduction in workforce. Major workforce restructuring measures were carried out from 1991 to 1992, and from 1995 to 1996. In 1998, CN announced a further reduction of 3,000 employees to be implemented in the second half of 1998 and in 1999.

While strong labour productivity gains were observed between 1986 and 1997, average annual labour costs per employee increased over that same period: \$63,000 in 1997 compared with \$42,000 in 1986. Nevertheless, unit labour cost has declined at an average annual rate of 3.4 per cent since 1986.

In 1997, fuel costs represented 9.5 per cent of total costs on average for CN and CP Rail. Although fuel cost shares have changed little over the past decade, significant fuel efficiency gains (output/fuel quantity) in Canadian rail operations have been achieved since 1996 because of investments in new locomotives.

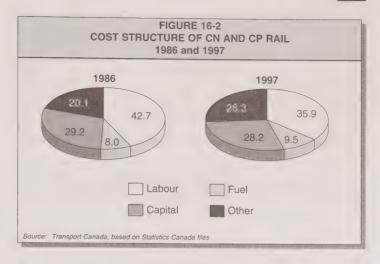


TABLE 16-2 EFFICIENCY INDICATORS FOR CN AND CP RAIL 1986 - 1997						
1986 1995 1996 199						
Employees (in 000)	72.0	42.4	39.4	38.0		
Average Labour Cost per employee (\$000)	41.8	61.7	61.0	63.3		
Productivity Change (per cent)	1986-97	1995	1996	1997		
Labour	7.3	1.1	10.9	14.6		
Fuel	1.4	(5.2)	6.6	2.5		
Total	4.0	1.1	9.1	4.9		
Unit Cost Change (per cent)	Unit Cost Change (per cent)					
Labour	(3.4)	5.9	(10.7)	(9.6)		
Total	(1.8)	4.2	(9.9)	(0.7)		
Source: Transport Canada, based on Statistics Ca	anada files					

Capital costs, including depreciation, leasing and return to financed capital, accounted for 28 per cent of total costs in 1997, which is 1 per cent lower than in 1986. A major factor of capital costs reduction is the write-down of assets by both CN and CP Rail in 1995.

Operating expenses other than fuel, labour and capital accounted for 26 per cent of railways' total costs in 1997. Major expenses in this group include materials, operating taxes, insurance and purchased services. Despite increases in the cost shares of this group from 1986 to 1997, the efficiency of using these inputs has been improved with average annual productivity gains of two per cent.

Total factor productivity of Class I freight railways improved

<sup>4</sup> Labour inputs are measured by annual changes in the number of employees. If working hours were used to derive labour input quantity, labour productivity growth will be slightly lower with an average annual growth rate of six per cent (compared with seven per cent by employee measures) from 1986 to 1997. The difference is due to increases in average number of hours worked/paid per employee over the past few years.

### TABLE 16-3 CN AND CP RAIL SPECIAL RESTRUCTURING CHARGES 1991 -- 1998\*

 1991
 1992
 1993
 1995
 1996
 1998

 Total System (\$ million)
 251
 1,405
 49
 2,596
 411
 590

 Canadian Operations (\$ million)
 251
 1,284
 41
 1,846
 411
 494

\* No significant special charges in 1994 and 1997 Source: CN and CP Annual Reports

# TABLE 16-4 RAIL FREIGHT COST SAVINGS AND PRICE REDUCTIONS 1992 - 1997

		1992-1997
	1997	Average
Carrier Cost Savings (\$ million)	2,225	1,178
User Price Savings (\$ million)	1,034	562
Cost Savings Passed to Users (per cent)	46.5	47.7
Source: Transport Canada		

at an average rate of four per cent per year from 1986 to 1997. Total unit costs have declined by an average annual rate of 1.8 per cent since 1986, as a result of such strong productivity gains. Overall, lower unit costs have allowed both CN and CP Rail to reduce their prices and improve their financial performance at the same time.

### **Impact of Productivity Changes**

In the short term, annual productivity gains may not necessarily result in higher profits, as operating margins could be adversely affected by other factors, such as depressed freight rates and rising input costs. Over the long term, however, both carriers and shippers can benefit from efficiency improvement.

In recent years, CN and CP Rail have reaped the long-term benefits resulting from the productivity gains they managed to achieve over the past decade. Between 1986 and 1997, their total factor productivity increased by 53 per cent, while operating margins improved by 58 per cent.

To achieve these productivity gains, however, both CN and CP Rail have incurred substantial restructuring charges since the beginning of 1990s, largely for workforce downsizing and write-down of assets. Table 16-3 shows special charges incurred since 1991. With such special charges included as operating expenses, railways reported significant losses in 1992 and 1995.

While productivity improvement allows firms to reduce their costs in competitive markets, at least some of the savings must be passed on to users/customers in terms of lower freight rates.

If the prices and costs of the rail freight sector had followed the general trends in the economy as a whole, both revenues (shipper's costs) and total costs of the rail sector would have been much higher than those reported.

On average, the industry had cost savings<sup>5</sup> of about \$1.2 billion per year from 1992 to 1997, with savings reaching \$2.2 billion in 1997. About one-third of these savings were due to lower labour cost increases in the industry compared with the unit labour changes in the economy as a whole. Approximately 48 per cent of these cost savings were returned to users in terms of lower prices. The average annual user saving is estimated at \$562 million from 1992 to 1997.

Table 16-4 shows rail freight cost savings and price reductions from 1992 to 1997.

#### **Financial Performance**

At the corporate level, profitability at CN and CP Rail continued to improve in 1998, following a strong performance in 1997. Their joint average operating ratio, including operations in both Canada and the US, declined to 77.3 per cent in 1998 from 78.5 per cent in 1997. CN and CP Rail also showed similar improvement in the financial results of their Canadian operations.

Cost reduction was the main factor behind the lower operating ratio in 1998. Rail freight revenues fell on average by 4.5 per cent, but operating costs came down by an estimated seven per cent.

- 5 The savings are measured as the difference between the actual revenues/costs of the carriers and the estimated revenues/costs they would have incurred if their output prices and unit cost had increased at the same pace as the one observed over the same period in the economy as a whole.
- 6 Due to changes in accounting practices by CN and CP Rail, operating ratios at the corporate level are reported on the basis of US generally accepted accounting practices (GAAPs). Operating ratios for their Canadian operations remain reported in Canadian GAAPs.

Apart from strong traffic growth, the financial performance of freight railways has improved in recent years because their unit costs have declined sharply through productivity gains. The decline in prices, on the other hand, was less significant.

Figure 16-3 shows rail cost and price indicators from 1987 to 1997.

Since 1986, the Canadian rail freight industry has undergone a full business cycle. The industry faced strong revenue growth in the mid-1980s, a revenue slow down from 1988 to 1989, a financial downturn in the early 1990s, and a recovery period from 1993 to 1996. The industry finally achieved record revenues and operating profits in 1997.

Table 16-5 charts the rail industry's financial ups and downs from 1986 to 1998.

In 1997, total operating revenues generated from the Canadian operations of the Class I freight railways were only nine per cent higher than their revenue level in 1986, which was also a year of relatively good performance for railways. But the profit margin (operating income over revenues) in 1997 was seven percentage points higher than in 1986. In dollar terms, operating profits increased \$486 million, reflecting higher rail profitability in recent years than a decade ago.

Regional railways also benefited from a strong Canadian economy in 1997. Their total revenues increased by 11 per cent, and their average profit margin improved by 4 per cent over 1996. These railways primarily serve local rail freight markets. Their growth is not evident because the operational and financial results of many new small railways that

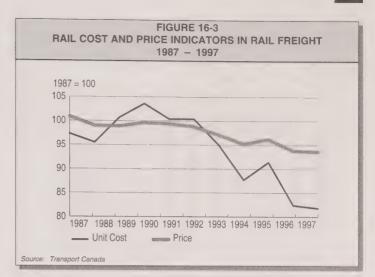


TABLE 16-5 FINANCIAL RESULTS FOR THE RAIL FREIGHT INDUSTRY 1986 - 1997					
1986 1995 1996 1997					
Class I Railways - Canadian Op	erations				
Revenue (\$M)	6,237	6,127	6,150	6,778	
Expenses (\$M) 1	5,557	5,565	5,215	5,612	
Operating Income (\$M)	680	562	934	1,166	
Operating Ratio (%)	89.1	90.8	84.8	82.8	
Regional/Shortline Railways					
Revenue (\$M)	673	671	652	726	
Expenses (\$M) <sup>1</sup>	550	587	608	647	
Operating Ratio (%)	81.7	87.5	93.3	89.2	
Excludes special charges     Source: Transport Canada based on Statistics Ca	nada's files and CN	and CP finan	cial statemen	ts.	

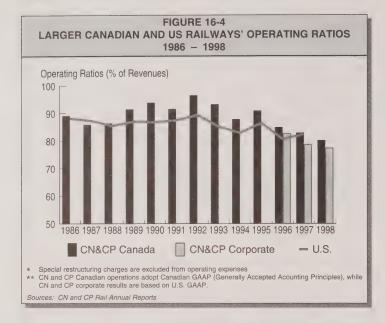
started up in late 1997 and in 1998 are not yet included in available statistics.

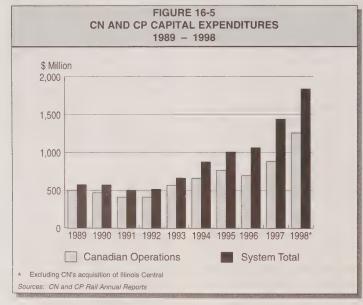
# Comparison of Operating Ratios of Larger Canadian and US Railways'

Figure 16-4 compares average operating ratios between Canadian and US Class I railways from 1986 to 1998. Notwithstanding the differences between Canadian and US accounting principles, the historical trends show that Canadian rail operations had about

the same operating ratio as US railroads in the late 1980s, but became less cost-efficient than their American counterparts in the early 1990s. Following the major cost reductions of recent years, Canadian railways achieved a level of efficiency comparable to the US railroads in 1997, with average operating ratio of 82.8 per cent, compared with 82.4 per cent for their US counterparts.

On the basis of US GAAPs,<sup>7</sup> the cost performance of the two





Canadian Class I railways surpassed the average of US railroads in 1997. Under the US GAAPs, the average operating ratios of CN and CP in 1997 and 1998 were 78.5 per cent and 77.3 per cent respectively.8

### **Capital Expenditures**

The recent improvement in the profitability of the rail freight industry has induced significant capital investments over the past two years. For instance, in 1998 CN made an acquisition offer for the US railroad, Illinois Central (IC), at a cost of \$2.4 billion in US dollars. The acquisition is in its last stages, with a US regulatory decision to be rendered in 1999.

Beside the IC acquisition, CN's and CP Rail's total capital expenditures amounted to \$1.8 billion in 1998, an increase of 28 per cent over 1997. About \$1.3 billion, or 61 per cent, was invested in their Canadian operations, with the rest going to their US holdings. Capital expenditures had to do mostly with the acquisitions of new locomotives, additions to the rolling stock and roadway renewal.

Figure 16-5 shows the trends in CN's and CP Rail's capital expenditures since 1989.

One of the major differences in GAAPs between Canada and the United States is in reporting track replacement costs. In Canada, these cost are included in operating expenses, while in the US they are capitalized. Based on restated CN and CP Rail financial statements, the operating ratios of Canadian railways reported in the US GAAPs are on average about three points lower than those reported in the Canadian GAAPs.

<sup>8</sup> CP Rail has adopted US generally accepted accounting principles (GAAPs) in reporting its financial results since 1997; CN started reporting on the basis of US GAAPs in 1998.

Table 16-6 shows CN's and CP Rail's identifiable assets in Canada and the US from 1995 to 1997, as reported in their respective annual reports. In 1997, CN had approximately 94 per cent of its total assets in Canada, compared with 76 per cent for CP Rail. CN's Canadian content in terms of proportion of total assets is expected to reduce substantially, however, if its IC acquisition is approved.

CN and CP Rail both showed healthy financial structures in 1998. Their financed capital consisted on average of 55 per cent equity, 37 per cent debt and eight per cent deferred taxes.

### VIA RAIL

VIA Rail Canada Inc. generated passenger revenues of \$143 million during the first three-quarters of 1998, an increase of 5.6 per cent from the same period in 1997. Prices climbed by 7.6 per cent, while output declined by two per cent. The analysis in this section focuses on 1991 to 1997, following the major reorganisation and downsizing of VIA Rail's activities.

#### **Output and Price Changes**

Since 1991, VIA Rail's price increases each year have exceeded general inflation trends, with the exception of 1995. From 1991 to 1997, VIA Rail's prices rose by 30 per cent, compared with 13 per cent in the general economy. VIA Rail's long-haul services recorded the strongest price increases, with an average of 6.6 per cent per year, while remote

TABLE 16-6 IDENTIFIABLE ASSETS OF CN AND CP RAIL BY GEOGRAPHIC SEGMENTS, 1995 – 1997					
CN	1995	1996	1997		
Canada (\$ million)	5,572	6,400	6,606		
U.S. (\$ million)	541	418	445		
Total (\$ million)	6,113	6,818	7.051		
CDN/Total (per cent)	91.2	93.9	93.7		
CP Rail					
Canada (\$ million)	6,067	5,474	5,996		
U.S. (\$ million)	1,874	1,942	1,843		
Other (\$ million)	1,215	923	3		
Total (\$ million)	9,156	8,338	7,842		
CDN/Total (per cent)	66.3	65.6	76.5		
Sources: CN and CP Annual Reports					

TABLE 16-7 PRICE AND OUTPUT CHANGES AT VIA RAIL 1991 - 1998				
	1990-1997	1995-1996	1996-1997	1997-1998
Price Changes (%)				
Corridor	3.7	5.3	6.1	6.7
Long Haul	6.6	11.3	7.3	8.6
Remote - Regional	2.5	5.0	2.7	14.2
Total VIA Rail	4.5	7.0	6.3	7.6
Output Changes (%)				
Total VIA Rail	0.1	(4.3)	(0.2)	(1.9)
Source: Transport Canada and VIA Rail				

regional services had more modest price changes. In 1998, however, the price of these services went up 14 per cent. VIA Rail's output grew until 1995, but has declined since then.

Table 16-7 shows VIA Rail's output and price changes from 1991 to 1998.

#### **Cost and Productivity Indicators**

In 1997, labour costs represented 37 per cent of VIA Rail's total costs. VIA Rail's labour costs dropped by \$50 million between 1991 and 1997. The year 1997 was the first one where passenger revenues exceeded labour costs. From 1991 to 1997, labour productivity increases of 42 per cent reduced unit labour costs by 23 per cent. VIA Rail's average labour cost per employee is 48 per cent higher than the average for the economy as a whole and the second highest <sup>10</sup> in the transportation sector.

<sup>9</sup> It includes an estimate of the opportunity cost of the capital used by VIA Rail, based on the value of its fixed capital times the capital cost rate of the railways. Exceptional charges, such as the write-off of assets or labour restructuring charges, were excluded.

<sup>10</sup> Per hour, VIA Rail workers make as much as CN and CP Rail workers, who receive the highest annual compensation in the transportation sector, but also work longer hours

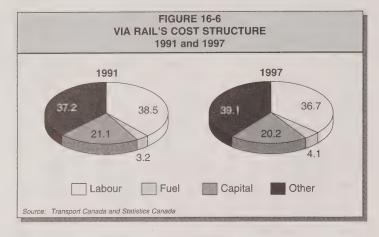


TABLE 16-8 EFFICIENCY INDICATORS VIA RAIL				
	1991	1995	1996	1997
Employees (in 000)	4.4	3.8	3.2	3.2
Average Labour Cost per employee (\$000)	50.9	51.3	56.5	56.6
Productivity Change (in %)	1991-97	1994-95	1995-96	1996-97
Labour	7.2	16.1	13.4	2.7
Total	6.7	11.9	4.2	4.0
Unit Cost Change (in %)				
Labour	(4.23)	(12.65)	(2.63)	(2.57)
Total	(3.46)	(9.08)	(0.10)	(1.38)
Source: Transport Canada				

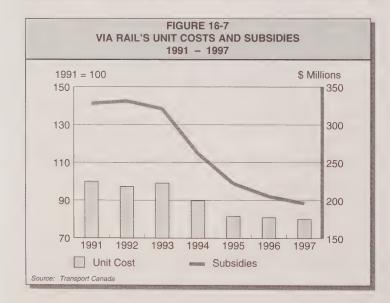


Figure 16-6 compares VIA Rail's cost structure in 1991 and 1997.

In 1997, VIA Rail's fuel costs represented 4.1 per cent of its total costs, more than in 1991. Increased fuel efficiency was not sufficient to offset higher fuel prices.

In addition, capital costs remained relatively stable from 1991 to 1997, coming in at slightly over 20 per cent of total costs. VIA Rail's other main cost items are marketing at ten per cent of total costs and payments to other carriers at nine per cent.

Since 1991, VIA Rail's costs overall have fallen by \$110 million, with a level of activity in 1997 that was marginally higher than it was in 1991. VIA Rail's costs came down as a result of robust productivity gains. VIA Rail's performance from 1993 to 1995 was particularly strong, increasing by more than ten per cent each year.

Table 16-8 shows VIA Rail's efficiency indicators, including employees, labour costs and productivity, from 1991 to 1997.

### **Financial Indicators**

Although VIA Rail's operating subsidies have dropped by more than \$130 million since 1991, it has adjusted by adopting strategies to increase its revenues and reduce its costs. On the revenue side, price increases were a major component of VIA Rail's strategies, generating additional revenues over the rate of inflation in the general economy totalling approximately \$14 million per year since 1992. Cost declines, in constant dollars, have averaged \$31 million per year.

Figure 16-7 illustrates the close link at VIA Rail between the reduction of costs and subsidies.

When the cost of capital is reflected in total costs, VIA Rail's cost recovery was more than 25 per cent in 1991 on a total system cost of \$596 million. In 1997, VIA Rail's cost recovery rose to 39 per cent. Per passenger. the difference between VIA Rail total costs and its revenues was equivalent to \$80 per passenger. Per passenger kilometre, VIA Rail charged 13 cents, while total costs were much higher at 34 cents. This 21-cent deficit per passenger kilometre is almost equivalent to the 25-cent average revenue per passenger kilometre for the larger regional airlines.

Table 16-9 looks at VIA Rail's financial performance results from 1991 to 1997.

### **Capital Expenditure**

Since 1991, VIA Rail's capital expenditure program has averaged \$34 million per year, which is less than the \$45 million that VIA Rail can set aside for depreciation.

Since VIA Rail's passenger revenues and subsidies barely cover its cash operating costs, VIA Rail's capital program is limited to what it sets aside for depreciation.

Overall, since 1991, VIA Rail's asset base has dropped by \$125 million or 20 per cent.

Table 16-10 shows changes in VIA Rail's fixed assets from 1991 to 1997.

### TRUCKING INDUSTRY

The analysis in this section focuses on the performance of forhire trucking firms with sales equal to or greater than \$1 million. Smaller firms are not included in the analysis because comprehensive data was not available. Individual carriers

TABLE 16-9 VIA RAIL'S FINANCIAL PERFORMANCE RESULTS 1991 - 1997				
	1991	1995	1996	1997
Operating Revenues (\$ million)	145	170	175	188
Operating Expenses (\$ million) 1	506	436	433	429
Total Cost (\$ million)	596	507	488	487
Cost Recovery Ratio (per cent) 2	24.3	33.6	35.9	38.6
Operating Subsidies (\$ million)	328	222	205	196
Includes depreciation, but excludes extraordinary charges     Operating Revenues divided by Total Cost				
Source: Transport Canada				

CHANGES IN VIA	BLE 16-10 RAIL'S FIXED <i>A</i> 1 - 1997	ASSETS
	Total	Average (Year)
Gross Capital Expenditure	240	34
Asset-Write Down	(48)	(7)
Depreciation	316	45
Net Investment	(125)	(18)

TABLE 16-11 PRICE AND OUTPUT CHANGES THE TRUCKING INDUSTRY					
1987-1997 <sup>1</sup> 1995-96 1996-97 1995					
Price Changes (per cent)					
Intraprovincial	1.0	(0.3)	1.1	(3.0)	
Interprovincial	0.2	(5.5)	4.5	(1.3)	
Transborder	0.9	(3.4)	3.3	0.2	
Total Trucking	0.8	(2.7)	2.7	(1.5)	
Output Changes (per cent)					
Intraprovincial	3.0	6.1	5.6	11.3	
Interprovincial	4.4	10.4	3.1	8.8	
Transborder	13.0	19.4	10.4	4.7	
Total Trucking	5.4	10.8	6.1	8.1	
Data by market segment were not before 1987     Based on the first two quarters of the year     Source: Transport Canada based on Statistics Car	nada Files				

whose main activity is the movement of household goods are also not included.

### PRICE AND OUTPUT INDICATORS

From 1987 to 1997, revenues increased by 6.3 per cent per year

in the for-hire trucking industry. More than 85 per cent of this growth came from increased activity because prices increased only marginally over the period, at 0.8 per cent per year.

Table 16-11 shows output and price chances in the trucking industry from 1987 to 1997.

# TABLE 16-12 REGIONAL INDICATORS OF TRUCKING ACTIVITY 1987 - 1997

	Trucking Revenues¹ 1997 Distri	Economy GDP bution in %	Trucking Revenues¹ 1987-1996	Economy GDP AAG in %
Atlantic	7.0	5.8	3.5	1.0
Quebec	19.6	21.6	5.8	1.4
Ontario	40.0	39.5	4.9	1.8
Prairies	21.4	20.3	5.8	2.5
B.C.	11.9	12.9	6.0	2.8
Total	100.0	100.0	5.4	1.9

AAG = Average Annual Growth GDP = Gross Domestic Product
1 From traffic originating and terminating in the region

Source: Transport Canada based on Statistics Canada files

# TABLE 16-13 TRUCKING PRICE CHANGES AT MID-YEAR (AAG IN PERCENT) FOR DOMESTIC OUTBOUND TRAFFIC, 1990 - 1997

	1990-1995	1995-1996	1996-1997
Atlantic	0.5	0.7	(0.4)
Canada less Atlantic	0.4	(1.8)	(0.3)

Source: Transport Canada, based on Statistics Canada's files

Preliminary results for the first half of 1998 show that revenue growth continued to be strong, gaining 6.5 per cent. The surge in trucking prices in 1997 was short lived as they returned to a pattern of decline in 1998.

When examined by markets, i.e. intraprovincial, interprovincial, or transborder, prices within the trucking industry followed a similar path as price changes varied by only a one per cent up or down.

In terms of output, however, differences were observed between markets. A major source of growth in trucking has been traffic to and from the US. Since 1987, the trucking performance in transborder markets has been phenomenal, with output growth in the two digit range. Output growth

for domestic markets has been more modest, at 2.5 per cent per year. In 1998, output growth is estimated to be in the order of eight per cent, led by strong growth in domestic activities.

When trucking prices are expressed in relation to rail freight prices, they went up by 13 per cent from 1986 to 1997. Despite this relative price disadvantage, the trucking industry has continued to increase its freight market share. For example, the rail mode had an estimated 32 per cent share of the combined freight revenues of the two modes in 1997, compared with a share of 46 per cent in 1986. This suggests that shippers are prepared to pay a premium for trucking services.

### REGIONAL INDICATORS

The regional distribution of trucking activity follows the distribution of economic activity. Ontario dominates with a 40 per cent share, which is the same as its share of economic activity. Both Atlantic Canada (Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland) and the Prairies (Manitoba, Saskatchewan and Alberta) have a trucking share that is larger than their share of economic activity. For Quebec and British Columbia, the reverse is true.

Table 16-12 shows regional indicators of trucking activity from 1987 to 1997.

Over time, British Columbia has shown the strongest trucking growth, which corresponds to the province's economic performance. Atlantic Canada, on the other hand, has exhibited the lowest performance in both trucking and the economy. Quebec's economic growth only exceeded that of Atlantic Canada, yet trucking activity in Quebec increased as fast as it did in the Prairies, where the regional economy has grown at a faster pace. The potential transfer of private11 to for-hire trucking in Quebec could explain this apparent inconsistency. The relative growth in demand for trucking services in Ontario is consistent with that of its economy.

Freight assistance programs in Atlantic Canada were revoked in July 1996. The programs were designed to reduce the transportation costs for domestic outbound traffic. The effective subsidy rate of the combined intraregional and westbound programs was 13 per cent, based on 1992 traffic data. The removal of the program

<sup>11</sup> A company that performs its own shipping of goods and services.

does not seem to have altered the pattern of price changes of outbound traffic from Atlantic Canada.

Table 16-13 shows that price changes in Atlantic Canada have continued to evolve more or less in tandem with those of the rest of the country, before and after the removal of the subsidy.

### COST INDICATORS

In 1997, labour costs were 45 per cent of total costs in trucking industry when owner-operators were factored in. Employment increased by 36 per cent from 1986 to 1997, making trucking the best performer in job creation in the transportation industry.

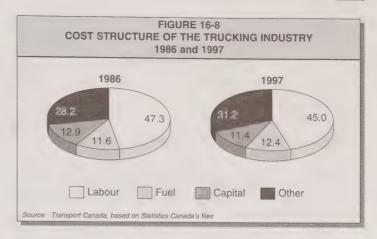
Figure 16-8 compares costs in the for-hire trucking industry between 1986 and 1997.

Much of the job creation in the trucking industry occurred after 1992. Industry activity, stimulated by economic recovery and lower trucking prices (-1 per cent), grew by 70 per cent, while labour productivity advanced by 27 per cent. These productivity gains translate into higher average salaries and a faster growth rate than the economy as a whole.

Unit labour costs dropped by four per cent in nominal terms from 1986 to 1997. If labour costs had increased in trucking at the same pace as in the general economy, they would have been higher by \$875 million, 16 per cent, on average. In recent years, labour productivity and unit cost performance of trucking have exceeded long-term trends.

Table 16-14 charts efficiency indicators for the trucking industry from 1986 to 1997.

In 1997, fuel costs in the for-hire trucking industry



. TABLE 16-14 TRUCKING INDUSTRY EFFICIENCY INDICATORS 1986 - 1997					
	1986	1995	1996	1997	
Employees (in 000) 1	104.0	128.4	134.3	141.1	
Average Labour Cost per employee (\$000) <sup>1</sup>	31.6	40.9	41.5	43.1	
Productivity Change (in %)	1986-1997	1995	1996	1997	
Labour 1	3.4	6.9	6.3	1.2	
Total	1.9	3.5	4.0	1.5	
Unit Cost Change (in %)					
Labour 1	(0.4)	(5.1)	(3.5)	2.6	
Total	0.1	(0.9)	(1.5)	1.0	
1 Adjusted to reflect the impact of owner-operat					
Source: Transport Canada based on Statistics	Canada files				

accounted for 12.4 per cent of total industry cost, slightly above its 1986 share. Although data reported since 1986 does not allow for accurate measurement of productivity improvement in the use of fuel within the trucking industry, it appears that fuel efficiency has gained 14 per cent in recent years, after several years of consecutive declines between 1988 and 1993.

Besides labour, capital was a major source of cost reduction in trucking. One factor in this reduction was the decline in the amount of capital used per dollar of output. While this may

represent a better utilization of assets, it may also reflect the aging of the capital stock used in the industry. Other factors include the use of more efficient power units, and changes in the fleet mix. The reduction of capital costs due to lower interest and tax rates was also a contributing factor.

Total factor productivity in the trucking industry increased by 1.9 per cent annually between 1986 and 1997. Trucking unit costs in 1997 were about the same as they were in 1986. Again, in recent years, industry performance in terms of productivity and unit costs exceeds longer term trends.

#### **TABLE 16-15** TRUCKING INDUSTRY COST SAVINGS AND PRICE REDUCTION 1992 - 19961992-1996 1997 Average 1,587 803 Carrier Cost Savings (\$ million) User Price Savings (\$ million) 1,191 625 Cost Savings Passed to Users (per cent) 75.0 77.9 Source: Transport Canada, based on Statistics Canada files

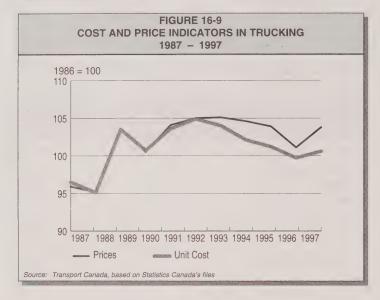


TABLE 16-16 SUMMARY FINANCIAL RESULTS THE TRUCKING INDUSTRY					
	1986	1995	1996	1997	
Operating Revenue (\$ million)	6,846	11,659	12,602	13,748	
Operating Expenses (\$ million)	6,578	11,116	12,193	13,084	
Operating Income (\$ million)	268	544	410	664	
Operating Ratio (per cent)	96.1	95.3	96.7	95.2	
Source: Transport Canada, based on Statistics Canada files					

### IMPACT OF PRODUCTIVITY

From 1996 to 1997, Table 16-15 shows estimated cost savings for both carriers and shippers resulting from productivity gains.

Carriers' cost savings are measured as the difference between the actual costs of the carriers and the costs they would have incurred if the unit cost had increased at the same pace as in the general economy. The same methods were used to measure users' revenues.

Between 1991 and 1997, strong productivity performance allowed the trucking industry to reduce its annual costs by about \$800 million

on average. In 1997, the cumulative savings were equivalent to \$1.6 billion or 12 per cent of the trucking industry cost base. The competitive level of the industry explains the high percentage of cost savings passed on to users in lower prices.

### FINANCIAL PERFORMANCE

The trucking industry can be viable with an operating margin equal to about 4 per cent of its revenues. The rail industry requires a higher operating margin because it requires significantly more assets than the trucking industry to generate a dollar of revenue.

Trucking is a very competitive industry, into which entry is relatively easy. Under such competitive forces, the market has its own clearing-house process. To survive, a firm must adjust costs to the prices dictated by the market. Within the industry overall, trends show unit costs following the same pattern as prices between 1987 and 1997. Trucking is an industry where excessive price increases are almost impossible, as they rapidly attract competitors which in turn lower prices.

Figure 16-9 shows cost and price indicators for the trucking industry over the period 1987 to 1997.

The trucking industry's financial position remained relatively stable from 1986 to 1997. Since 1986, the operating ratio of the for-hire trucking industry has hovered around 96 per cent, even with reduced performance in the late 1980s and early 1990s, which other industries in the transportation sector also experienced.

Table 16-16 shows the trucking industry's financial indicators from 1986 to 1997.

An upward trend was evident after 1992, when the operating ratio improved by 2.4 per cent to 95.2 per cent in 1997. This translated into a 45 per cent improvement in profitability, measured by the return on fixed assets. Improved profitability seems to have continued in 1998, based on the performance of large carriers in the first three quarters of the year. The operating ratio of this group of carriers fell by close to one per cent from 95.6 per cent to 94.7 per cent between 1997 and 1998

### CAPITAL EXPENDITURE

From 1986 to 1991, net investment<sup>12</sup> in trucking amounted to a \$70 million per year. When capital expenditures and depreciation are expressed in constant dollars, the net addition to the capital base within the trucking industry in 1991 was estimated to be seven per cent over its 1986 levels. Over that same period, the industry's output advanced by 12 per cent

From 1992 to 1997, the industry more than doubled its gross capital expenditure program to \$805 million per year compared with the period from 1986 to 1991. On average, net capital expenditure amounted to \$314 million per year. In constant dollars, the value of fixed assets rose by 66 per cent from 1991 levels, still lagging behind the 72 per cent growth in industry activity.

Table 16-17 illustrates capital expenditures in the trucking industry from 1986 to 1997.

	TABLE 16-17 CAPITAL EXPENDITUR IN THE TRUCKING INDUS	-				
Annual Averages in \$ Million						
	1986-1991	1992-1997	1986-1997			
M & E						
Gross	314.7	775.7	545.2			
Depreciation	269.8	468.7	369.2			
Net	44.9	307.0	176.0			
Total						
Gross	356.4	805.3	580.8			
Depreciation	285.9	491.0	388.4			
Net	70.5	314.3	192.4			

PRICE AND OUTPUT CHANGES IN THE INTERCITY BUS INDUSTRY 1986 - 1997					
Price Changes (9/)	1986-1997	1994-1995	1995-1996	1996-1997	
Price Changes (%) Regular Bus Services	3.6	2.4	7.4	3.0	
Charter Bus Services	0.4	(4.4)	2.2	0.3	
Total Bus²	1.7	(1.3)	1.4	(0.1)	
Output Changes (%)					
Regular Bus Services	(3.7)	(14.0)	(4.9)	(4.2)	
Charter Bus Services	2.5	26.0	0.9	(9.8)	
Total Bus <sup>2</sup>	0.1	6.5	(0.9)	(2.9)	

### **BUS INDUSTRY**

### THE INTERCITY BUS

The bus industry includes three segments: the intercity bus industry, which provides bus services on a scheduled or a charter basis; school bus operators; and the urban transit industry.

Source: Special Compilation done by Statistics Canada

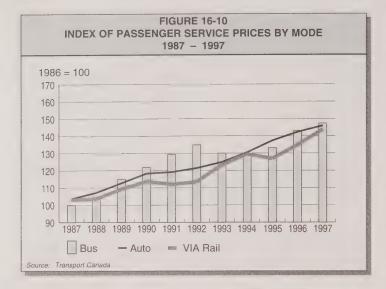
In 1997, the revenues of intercity bus carriers fell to \$593 million, a three per cent decline from 1996. This segment of the bus industry accounts for

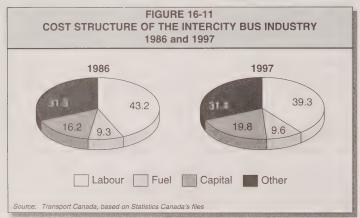
12 per cent of total bus activity. The activities of school bus operators, whose revenues exceeded \$1 billion in 1997, are not covered in this chapter. The performance of transit operators is reviewed in a separate section.

### **Output and Price Indicators**

The revenue growth of the intercity bus industry has averaged 1.8 per cent per year since 1986. Prices have been the major source of revenue changes. Table 16-18 shows price and output changes in the intercity bus industry from 1986 to 1997.

<sup>12</sup> Includes the acquisition of fixed assets, owned or leased, excluding land, by all trucking firms.





Total revenues of the industry can be divided as follows: 82 per cent passenger services, 12 per cent parcel services and six per cent other activities. In 1997, scheduled bus operators had a 51 per cent share of the activity compared with 68 per cent in 1986.

Although a carrier classified as a scheduled bus operator may also have generated a small percentage of its revenues from chartering services and vice versa, the slower growth of scheduled carriers can be attributed to a sluggish demand for scheduled services.

Until the 1990s, scheduled intercity bus services generated between 55 and 60 per cent of the total bus passenger revenues. In 1997, these services contributed approximately 45 per cent of passenger revenues.

When output measures are used, the decline in the share of scheduled services is even more striking. Between 1986 and 1997, the output

of charter services grew by 31 per cent,<sup>13</sup> while the output of scheduled services declined by 34 per cent. One of the factors behind the growth of charter bus operations over the same period has been the relative stagnation of the prices of these services. Over the same period, the prices of intercity services increased by 47 per cent.

Changes in the prices of scheduled bus services track the trends observed in the price of competing services. Price changes in scheduled bus services, on the one hand, and changes in the cost of the automobile and VIA Rail services, on the other, correlate well with each other and confirm the congruity of the trends.

Figure 16-10 shows price changes for various passenger services according to mode from 1987 to 1997.

### **Cost Indicators**

The bus industry is labour intensive. In 1997, labour costs represented about 37 per cent of the total industry costs, which was down from 43 per cent in 1986. This ratio has remained an average of three per cent higher than the rest of the transportation sector since 1986.

That said, the bus industry still has a labour cost per employee significantly lower than the economy as a whole. In 1997, it averaged 33 per cent lower than that of the economy. This differential has increased in recent years. Previously, it was less than ten per cent. This drop can be explained by the productivity performance of the industry.

Figure 16-11 compares the cost structure of the intercity bus industry in 1986 and 1997.

<sup>13</sup> The decline of charter activity in 1997 is mainly caused by a major drop of charter services offered by scheduled carriers. It could also be the result of a reclassification of bus companies by Statistics Canada.

Between 1989 and 1992, labour productivity in the bus industry fell by 12 per cent, while the relative labour cost of the industry declined by about the same percentage. Since then, however, productivity has rebounded by 24 per cent, but the salaries in the bus industry have continued to fall in relation to the economy's average. One of the factors in this decline is the growing importance of charter carriers, whose average salaries are 55 per cent of those employed by scheduled operators. Productivity gains and reduced salary increases allowed unit labour costs to fall by 11 per cent between 1992 and 1997.

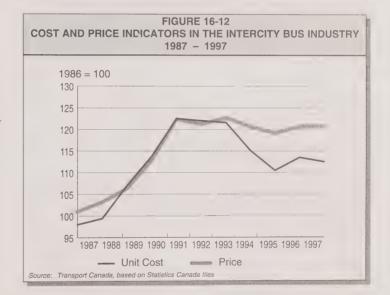
Table 16-19 shows efficiency indicators in the intercity bus industry from 1986 to 1997.

In 1997, fuel costs represented only 9.6 per cent of the bus industry cost, a shade higher than in 1986. Other operating costs, including marketing, materials other than fuel, insurance and other miscellaneous expenses, amounted to 31 per cent of total costs in 1997. This proportion has been relatively stable over time. The share of capital costs (leasing, depreciation, and financing) increased from 16 per cent to close to 20 per cent of total costs. This is indicative of increased capital intensity in the industry.

Overall, the productivity of the intercity bus industry increased by less than one per cent per year between 1986 and 1997. Charter operators have demonstrated a better productivity performance. Since 1986, their productivity has increased by 19 per cent, while the scheduled segment of the industry shows no growth.

Between 1991 and 1997, industry productivity bounced back, allowing the industry to reduce its

**TABLE 16-19 EFFICIENCY INDICATORS IN THE INTERCITY BUS INDUSTRY** 1986 - 1997 1986 1995 1996 1997° Employees (000) 7.9 8.3 8.0 7.5 Average Labour Cost 24.4 25.7 25.8 25.7 per employee (\$000) Productivity Change (%) 1986-97 1994-95 1995-96 1996-97 Labour 1.9 2.1 6.2 7.4 Total 0.6 6.9 (2.7)24 Scheduled Carrier 0.0 4.1 0.2 (1.8)Charter Carriers 1.6 11.5 (6.4)7.7 Unit Cost Change (%) Labour 0.2 (0.1)(3.3)(3.6)Total 1.1 (4.0)2.7 (0.9)Scheduled Carrier 1.5 (1.6)(0.3)3.5 Charter Carriers 0.5 (7.6)6.9 (5.9)P = Preliminary Source: Transport Canada, based on Statistics Canada files



annual costs<sup>14</sup> by \$66 million on average. Because about \$42 million was returned to users in terms of lower prices, the financial performance of the industry has improved in recent years.

#### **Financial Performance**

In the middle of the 1980s, industry unit cost changes were

stronger than its price changes. From 1989 to 1992, the industry was able to increase its prices at the same pace as its cost increases. Since 1993, industry prices have fallen but less rapidly than costs. This has resulted in an improvement in the industry's financial performance.

<sup>14</sup> Cost savings are in real terms and are measured as the difference between the actual costs of the carriers and the costs they would have incurred if their unit cost had increased at the same pace as in economy. The same computations were performed to measure user savings on carrier revenues.

#### **TABLE 16-20** SUMMARY FINANCIAL INDICATORS FOR THE INTERCITY SCHEDULED AND CHARTER BUS INDUSTRIES, 1986 - 1997 1997° 1986 1995 1996 485.9 608.7 611.3 593.5 Operating revenues (\$ millions) 368.0 341.7 303.7 Scheduled 331.6 154.4 240.7 269.7 289.8 Charter & other 532.9 Operating expenses (\$ millions) 457.5 541.2 553.9 Scheduled 313.4 332.9 305.6 277.0

144.2

94.2

94.5

93.4

208.3

88.9

90.5

86.5

248.3

90.6

89.4

92.1

255.9

89.8

91.2

88.3

P = Preliminary

Scheduled

Charter & other

Charter & other

Operating ratio (per cent)

Source: Transport Canada, based on Statistics Canada files

# TABLE 16-21 PRICE AND OUTPUT CHANGES OF TRANSIT SYSTEMS AND PRICE CHANGES OF COMPARABLE SERVICES, 1986 - 1997

	1986-1997	1994-1995	1995-1996	1996-1997
Price Changes (Average Annu	ial Growth	in per cer	nt)	
Transit fare	5.5	1.8	6.4	3.5
Intercity Bus	2.0	(1.4)	2.5	(8.0)
Automobile	3.4	(2.1)	6.4	6.7
Output Changes (Average An	nual Growt	h in per c	ent)	
Passengers	(0.8)	0.2	(1.1)	2.2
Vehicles-km	(0.2)	(4.7)	(3.9)	5.5

Figure 16-12 shows cost and price indicators for the intercity bus industry from 1987 to 1997.

Source: Transport Canada, based on Statistics Canada files

Following a year of strong growth in 1995, the bus industry's total revenues leveled in 1996 and receded in 1997. In the last two years, total revenues of the charter bus industry increased by 20 per cent, an increase offset by a 17 per cent decline in the scheduled bus services sector. Both industry segments showed improved profitability, compared with the mid-1980s. Their current profit margin appears to be at a level acceptable and viable for the industry.

Table 16-20 summarizes financial indicators for the

intercity scheduled and charter bus industries from 1986 to 1997.

### TRANSIT SYSTEMS

This section reviews the activities of transit and urban operator members of the Canadian Urban Transit Association. In 1997, the transit industry generated \$1.7 billion from the users of their systems. Operating subsidies were \$1.5 billion. The combined user revenues and subsidies represented two thirds of the operating revenues of the total bus industry.

#### **Output and Price Changes**

Since the mid 1980s, the patronage of transit systems has declined by 11 per cent or

1.1 per cent per year. The decline in vehicle-kilometres has been less pronounced., which may suggest a drop in load factors. One explanation for the decline in ridership has been the pace of fare increases, now at 5.5 per cent per year. This is 2.8 times the increase in intercity bus prices.

Compared with the cost of automobile use, however, the changes are not as significant. Over time, the prices of transit systems have increased by 26 per cent relative to the cost of using automobiles. It is obvious that there are factors in the decline of transit systems other than the relative cost of the services. An automobile is more convenient and flexible, for example, which offsets its higher usage costs.

Table 16-21 compares price and output changes for transit systems and price changes for comparable services from 1986 to 1997.

### **Regional Indicators**

Increases in transit system prices between 1986 and 1997 have occurred in spite of massive subsidies. Since 1986, \$23 billion has been transferred by governments to transit authorities. This amount equals \$1.34 per passenger carried over that period.

Table 16-22 shows regional indicators, including subsidies, for transit systems in 1997.

By region, Ontario appears to be the better served by transit/urban systems. As much as 69 per cent of the Ontario population has access to public transit systems, compared with 46 per cent for the rest of the country.

However, Quebec has the highest number of annual trips at 58 per capita, compared with

41 for the rest of the country. Quebec users pay the lowest fare, at 84 cents per trip, compared with \$1.14 for the country as whole. On a per trip basis, the highest subsidies are provided to western Canadians. A contributing factor is that in British Columbia, capital expenditures are not directly subsidized and transit authorities borrow more heavily than elsewhere. Higher debt costs are offset by higher operating subsidies.

### **Cost and Productivity Indicators**

The cost structure<sup>15</sup> of the industry has been relatively stable over time. Labour represents the largest cost component, accounting for as much as 55 per cent of total transit costs in 1997. Depreciation and capital costs are next, accounting for close to a quarter of total costs. This breakdown makes transit the second most capitalintensive industry in the transportation sector after the rail freight industry. Energy costs are not large, representing about five per cent of total costs in 1997. Fuel efficiency has been trending downwards.

Figure 16-13 shows the breakdown of total costs for 1986 and 1997.

In 1997, 38,000 workers were employed by transit authorities, up 7 per cent from 1986. Employment, however, peaked in 1993, at 41,800 and has been declining since then.

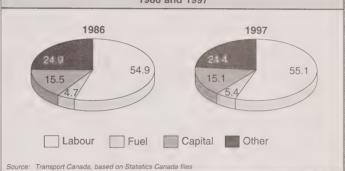
Average annual labour cost in the sector averaged \$55,000 in 1997, a 43 per cent increase from 1986. This makes transit workers the best-paid employees in transportation after the rail industry. <sup>16</sup> Labour costs in other

### TABLE 16-22 REGIONAL INDICATORS OF TRANSIT SYSTEMS 1997

	ı	Passengers in per cent	Revenues per Passenger in cents	Subsidies per Passenger¹ in cents	Population Served <sup>2</sup> in per cent
Atlantic		1.6	117.3	77.1	27.0
Québec		31.7	84.4	116.5	45.2
Ontario		44.1	138.7	65.1	68.6
West		22.5	108.6	182.8	52.4
Total		100.0	114.2	108.2	54.6
1 Total subsidies.	2 1995 data.				

FIGURE 16-13 COST STRUCTURE OF TRANSIT SYSTEMS 1986 and 1997

Source: Transport Canada based on Statistics Canada files



EFFICIENCY INDICA	TABLE 16-23 EFFICIENCY INDICATORS IN TRANSIT SYSTEMS 1986 - 1997  1986 1995 1996 1997					
	1986	1995	1996	1997		
Employees (000) <sup>1</sup>	35.8	39.0	38.4	38.0		
Average Labour Cost per employee (\$000) 1	36.9	50.9	52.3	52.8		
Productivity Change (%) Labour Total	1986-97 (0.5) (0.9)	1994-95 (3.6) (4.9)	1995-96 (2.2) (3.4)	1996-97 5.6 4.1		
Unit Cost Change (%) Labour Total	3.8 3.8	4.0 6.0	5.0 6.0	(4.3) (2.9)		
Source: Transport Canada based on Statistics	Canada files					

<sup>15</sup> Reported data on depreciation and debt charges are somewhat uncertain due to diversity of accounting systems among transit authorities. They have been substituted by Transport Canada computations based on stock of capital estimates.

<sup>16</sup> Per hour, the salary of transit workers exceeds that of rail workers.

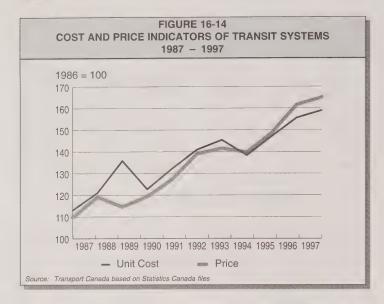


TABLE 16-24 SUMMARY FINANCIAL INDICATORS OF TRANSIT SYSTEMS 1986 - 1997						
	1986	1995	1996	1997		
Operating Revenues (\$ million) 1	1,041	1,545	1,621	1,712		
Cash Operating Expenses (\$ million)	1,835	2,752	2,790	2,788		
Capital Cost (\$ million) 2	598	813	857	912		
Total Cost (\$ million)	2,433	3,565	3,648	3,700		
Operating Subsidies (\$ million)	1,238	1,584	1,561	1,495		
Capital Subsidies (\$ million)	371	414	450	494		
Cost Recovery Ratio (per cent) 3	42.8	43.3	44.5	46.3		
1 Excludes subsidies 2 Estimated depreciation and opportunity cost of capital 3 Revenues before subsidies divided by Total Cost						
Source: Transport Canada based on Statistics Canada file	es					

transportation industries have increased by 35 per cent over the same period.

More significant are the 57 per cent productivity gains of the transportation sector, as opposed to the five per cent decline in transit systems. Per unit of output, labour cost rose 51 per cent in the 1986 - 1997 period, whereas they decreased by ten per cent in other transport industries.

Table 16-23 charts efficiency indicators, including employees, productivity and labour costs, from 1986 to 1997.

Overall, the productivity of transit systems is estimated to have declined by nine per cent since 1986. This compares with the 28 per cent gains registered by the rest of the transportation system. Unit costs have increased by 51 per cent.

The trends were reversed in 1997. Both labour and total

productivity improved, while unit costs fell 2.9 per cent, thanks also to stable salaries.

The productivity problem of transit systems is not unique to Canada. It is observed in other countries, and there are many reasons for it. The decline in productivity is partly due to the urban transit mandate, which has been made more difficult by urban sprawl. As the scope of transit systems extends to suburban areas, the density of the population diminishes, and transit systems have to serve thinner markets over longer distances. The resulting operational difficulties are significant, especially when needs are also very diversified. Price increases for urban transit services in recent years have also reduced the differential with the costs of using an automobile. The resulting reduction in ridership could not be offset by the investments to maintain and upgrade the systems. The automobile is a formidable competitor, providing a more convenient form of personal transportation.

Between 1986 and 1993, transit costs increased rapidly and at a faster rate than the price of their services. On average per year, transit costs increased by \$310 million in excess of inflation trends in the economy. Revenues increased at a pace faster than inflation, resulting in a net average increase of revenues of \$94 million a year. In more recent years, transit unit revenues have been increasing more rapidly than unit costs, 4.3 per cent as opposed to 2.7 per cent. This was in response to changes in subsidy levels.

Figure 16-14 shows transit system cost and price indicators from 1987 to 1997.

### **Financial Indicators**

The total cost of transit systems was estimated at \$3.7 billion in 1997. Cash operating costs were \$2.8 billion. Users paid 46 per cent of the total cost of the system, and their contribution to cash operating costs reached 61 per cent. The share contributed by users to total or cash costs was trending downwards until 1993 after which it started to climb slowly but steadily due to more rapid increases in fares and slowdown in unit cost increases.

Table 16-24 summarizes transit system financial indicators from 1986 to 1997.

### **Capital Expenditure**

The capital expenditure of transit authorities averaged \$528 million per year from 1986 to 1997. Net investment reached \$186 million per year, which allowed transit authorities to increase the asset base of transit systems nominally by 77 per cent. In constant dollars, the capital stock in the industry rose by 23 per cent over the same period, while the number of passengers carried fell by nine per cent. (Table 16-25)

The capital expenses of transit authorities accelerated from 1992 to 1997. Average annual net investment increased 1.7 times over the period 1986-1991. In fact, most of the gains in the capitalization of the transit authorities occurred after 1991. The decline in ridership noted earlier was also evident after 1991.

### TABLE 16-25 CAPITAL EXPENDITURES IN TRANSIT SYSTEMS 1986 – 1997

(Average ii	n \$ million)			
	1986-1991	1992-1997	1986-1997	
Total Capital Expenditure	388	666	527	
Expenditure on Vehicles	168	317	243	
Expenditure on Rights of Way	33	172	103	
Net Investment	110	261	186	
Source: Transport Canada based on Statistics Canada	files			

### MARINE TRANSPORTATION INDUSTRY

This economic and financial analysis of the marine transportation industry focuses mainly on the performance of for-hire marine carriers comiciled in Canada. This excludes government carriers, such as Marine Atlantic or B.C Ferries. In addition, it does not include companies, such as CP Ships and Canada Maritime, which have their ships registered outside of Canada. Nor does it include transportation undertakings, such as terminal operators, port and pilotage authorities, and St. Lawrence Seaway Authorities. The analysis covers the periods from 1991 to 1997.17

In 1997, industry revenues totalled slightly less than \$2 billion, representing a decline of four per cent from 1996. Freight revenues amounted to \$1.2 million, accounting for 58 per cent of the industry's total revenues. Charter services have become a major activity in water transportation in recent years, generating revenues in the order of \$400 million, or 20 per cent. Passenger transportation and other

activities contributed four per cent and 16 per cent, respectively, to total industry revenues.

In freight activities, about 60 per cent of total revenues were generated from international services and 40 per cent from domestic services, mainly inland waterways and coastal shipping.

# OUTPUT AND PRICE CHANGES

Table 16-26 presents price and output changes in marine transportation by three service groups: domestic freight, international freight and chartering services.<sup>18</sup>

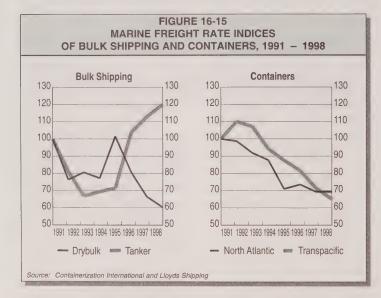
Between 1991 and 1997, total output of the Canadian shipping industry increased on average by one per cent per year, which can be attributed to strong growth in chartering activities and non-shipping activities.

International marine freight, including transborder and overseas activities, were trending upward between 1991and 1996, before dropping by 18 per cent in 1997. Much of this growth has been in overseas markets, which now make up more than 85 per cent of the international activity of Canadian-domiciled carriers.

<sup>17</sup> The period of analysis is limited to the 1991 – 1996 period because changes in the scope of industry survey make data prior to 1991 incompatible and because 1996 is the latest data available.

<sup>18</sup> Chartering involves a contract between a shipowner and a client for the carriage of goods or the use of a vessel, with or without a crew.

TABLE 16-26 PRICE AND OUTPUT CHANGES FOR MARINE TRANSPORT 1991 - 1997							
		1994-1995 <sup>1</sup>	1995-1996 <sup>1</sup>	1997-19972			
Average Annual Price Changes (%)							
Domestic Services	0.7	(1.5)	(0.5)	(0.9)			
International Services	3.7	2.4	3.6	2.5			
Chartering	1.9	(0.1)	0.7	0.2			
Total Shipping	2.1	0.5	1.5	0.8			
Average Annual Output Change	es (%)						
Domestic Freight	(5.5)	21.2	(8.3)	(7.5)			
International Freight	(3.1)	1.3	(3.4)	(20.1)			
Chartering	7.4	21.7	(11.3)	2.5			
Total Shipping	1.0	12.9	(5.8)	(4.6)			
1 Revised data based on new survey design	2 Preliminar	у					
Source: Transport Canada based on Statistics Ca	anada files						



In the domestic market, the Pacific region is the only region where the level of activity in 1997 was higher than the one observed in 1991. On every other domestic and transborder market, the output of Canadian shipping carriers declined substantially.

Shipping freight rate increases have averaged 2.5 per cent per year since 1991, more than the two per cent price increases observed in the economy as a whole over the same period.

Foreign shipping lines provide most of the shipping services used by Canadian shippers in overseas markets. Two broad types of services are provided: liner services, which are used to handle container traffic and offered by shipping lines, some of which are members of shipping conferences; and bulk shipping services, which are used to ship bulk commodities and offered by independent shipping lines.

Despite strong demand, liner services have been affected by rampant excess capacity, which has caused major erosions in freight rates on both the north Atlantic and Pacific routes since 1992. In the first half of 1998, rates on the north Atlantic container liner services remained relatively stable at their 1997 level, but rates on the Pacific routes continued to fall, a situation that can be attributed to the Asian currency crisis. Tanker rates in 1994 bottomed out to 69 per cent of 1991 levels but have since rebounded by 63 per cent. Freight rates of dry bulk carriers, despite some degree of volatility, have been trending downward: in 1997, they reached only 67 per cent of their 1991 level. In the first half of 1998, dry bulk rates fell again by nine per cent compared with the first half of 1997.

Figure 16-15 illustrates marine freight indices for bulk shipping and containers from 1991 to 1998.

## COST AND PRODUCTIVITY INDICATORS

Marine is the least labour intensive sector within the transportation service industry. In 1997, the marine sector's labour costs represented approximately 19 per cent of total costs. Such a low labour factor is partly explained by the recourse to vessels chartered complete with their own crew. Carriers which do not make use of chartering services had a 29 per cent labour cost share in 1997. Purchased services, chartering being the most significant one, accounted for 22 per cent of the industry's total costs. Fuel costs represented nine per cent of total costs in the marine sector in 1997, down from 10 per cent in 1991. Among other costs, one of the most important

categories is fees (including tolls, port and navigation aid fees, among others), which accounted for five per cent of total costs in 1997.

Figure 16-16 compares the breakdown of total costs in the marine shipping industry for 1991 and 1997.

From 1991 to 1997, labour productivity of the shipping industry increased annually by 4.1 per cent, while unit labour costs decreased by 2.1 per cent. As previously mentioned, some of these gains can be attributed to an increasing reliance on chartered vessels, which provided a substitute for internal labour. In this case, the total factor productivity is a more accurate measurement of efficiency gains than labour productivity.

Despite strong growth in labour productivity measurement, total factor productivity improved only by an average annual rate of 1.8 per cent from 1991 to 1997. Such a performance needs to be compared with the average annual productivity gains of all other transport modes at 3.4 per cent over the same period. While unit costs in marine transportation increased marginally during the period, there were some modest declines since 1994.

Table 16-27 shows efficiency indicators for the marine transportation industry from 1991 to 1997.

If annual changes in the costs of the marine industry had been the same as those in the economy as a whole, it is estimated<sup>19</sup> that its costs would have been \$30 million higher in 1997. These cost savings

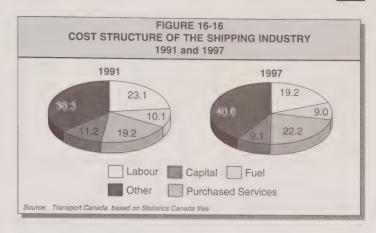


TABLE 16-27 EFFICIENCY INDICATORS FOR THE MARINE TRANSPORTATION INDUSTRY, 1991 – 1997						
	1991	1995	1996	1997		
Employees (000)	8.6	8.7	7.2	7.3		
Average Labour Cost per employee (\$000)	46.3	47.9	52.4	51.1		
Productivity Change (%)	1991-96	1994-95 <sup>1</sup>	1995-96 <sup>1</sup>	1996-972		
Labour	4.1	8.6	13.9	(5.1)		
Total	1.8	3.5	4.4	1.3		
Unit Cost Change (%)						
Labour	(2.1)	(6.3)	(1.5)	0.3		
Total	1.0	(0.7)	1.7	(1.1)		
1 Revised data 2 Preliminary						
Source: Transport Canada based on Statistics C	Canada files					

were not passed on to freight users since the prices of marine freight services increased more rapidly than the price increases observed in the economy.

### FINANCIAL PERFORMANCE

The marine transportation industry, after a period of stagnation in the early 1990s, has shown some revenue growth in both 1994 and 1995 before coming down again in the following two years. From 1991 to 1997,

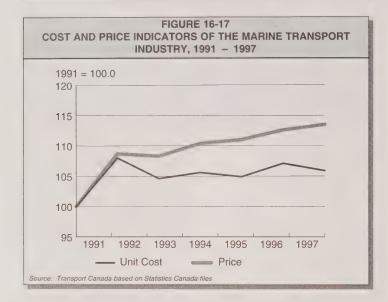
total revenues increased by an average of 3.2 per cent per year. Most of this growth came from chartering and residual activities. Revenues from international freight services showed significant increases from 1993 to 1996 but fell sharply in 1997.

Table 16-28 presents total operating revenues, expenses, profits and operating ratios of the industry from 1991 to 1997.<sup>20</sup>

<sup>19</sup> The savings are measured as the difference between the actual revenues/costs of the carriers and the estimated revenues/costs they would have incurred if their output prices and unit cost had increased at the same pace as in economy.

<sup>20</sup> Due to survey changes in 1996, previous years' data were restated and may be different from those presented in the 1997 report.

TABLE 16-28 FINANCIAL INDICATORS OF THE MARINE TRANSPORTATION INDUSTRY, 1991 - 1997						
	1991	1995	1996	1997		
Revenue (\$ million)	1,647	2,163	2,068	1,989		
Expenses (\$ million)	1,609	2,046	1,953	1,835		
Gross Margin (\$ million)	38	117	115	154		
Operating Ratios (per cent)	97.7	94.6	94.4	92.3		
Source: Transport Canada based on Statistics Canada files						



Revenues in domestic freight activities have dropped by 25 per cent from 1991 to 1997 as a result of reduced level of activity and marginal price increases. Due to the yearly fluctuation in traffic and revenues, there has not been a clear trend for each region of shipping activity: inland, Pacific, Atlantic, and Arctic and Mackenzie River. The Pacific coast has been an exception as its freight revenues in 1997 were higher than in 1991.

On average, regional distribution of total domestic shipping revenues from 1991 to 1997 showed that the Pacific coast region had the highest share with 43 per cent of total domestic marine revenues, followed by the inland waterways with 40 per cent, the Atlantic region with 12 per cent, and the Arctic and Mackenzie River region with five per cent.

Since 1992, the operating ratio of the marine industry has been improving every year to reach 92.3 in 1997. The impovement in the profitability came from price increases more significant than the unit cost changes.

Figure 16-17 charts shipping cost and price indicators from 1991 to 1997.

### CAPITAL EXPENDITURES

The market recovery after 1993 did not create a surge of investments. Capital expenditures in the industry remained inferior to accumulated depreciation and assets withdrawal over the 1994-1997 period. Net investments bave been consequently negative, averaging - \$27 million per year over that period.

Investment trends in Canadian shipping industry are difficult to assess precisely, with capital investments shifting toward chartering rather than owning vessels. Another problem is the ownership of ships by holding companies that charter the ships to their operating subsidiaries.

### AIR TRANSPORT INDUSTRY

In 1997, the Canadian airline industry generated revenues of \$11 billion, an increase of 9.6 per cent over 1996.

Air Canada, Canadian Airlines International (CAIL) and their affiliates accounted for 72 per cent of industry revenues and form the basis of the productivity analysis of this section. Large independent operators such as Air Transat, Canada 3000, Royal Air and Westjet produced about ten per cent of industry revenues and are included in the analyses of market structure, price and output changes, cost structure and financial performance.

In this section, Air Canada, CAIL, their affiliates and large independent carriers will be referred to collectively as the airline industry. Other carriers, mostly Level III and Level IV, have the remaining 18 per cent

market share of industry revenues. Their activities are not included in this analysis.

In 1997, approximately 89 per cent of the industry's operating revenues come from passenger transportation services. Cargo accounts for 6.7 per cent, and the remaining 3.8 per cent came from other flying services and incidental air transport services.

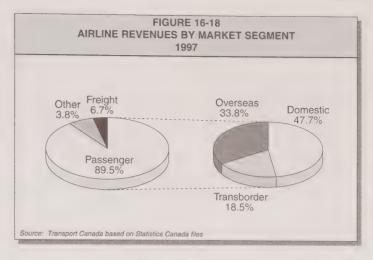
Domestic passenger services accounted for almost 48 per cent of the passenger market, a share that was once close to 56 per cent in the mid-1980s. Transborder and overseas markets have made gains in terms of percentage points, but the relative gains of transborder markets have been more significant.

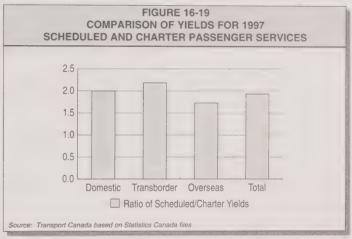
Figure 16-18 illustrates the breakdown of airline revenues in 1997.

The share of passenger charter service reached 11 per cent of total passenger revenues in 1997. This share has varied between nine per cent and 12.5 per cent since 1986. Charter activities are available only in some of the highest density domestic markets as well was in popular destinations in Europe and Central America.

Charter services are attractive to consumers because their prices are lower than prices for scheduled services. In fact, in each market, charter services yield lower revenues per passenger-kilometre than scheduled services.

Figure 16-19 compares the yields of charter and scheduled services by market, standardizing the yields to neutralize the effect of stage-length differences.<sup>21</sup> In





domestic and transborder markets where the market share of charter services is small, scheduled services generate revenues per passenger-kilometre at least twice as high as charter services. In overseas markets where the role of charter services is much more significant, however, scheduled services generate more revenues per passenger-kilometre, but the gap is reduced to less than 75 per cent.

# PRICE AND OUTPUT CHANGE

From 1986 to 1997, the prices of domestic services increased by 32 per cent, a rate of 2.6 per cent per year. Prices have also increased every year, except for a pause in 1992 and from 1995 to 1996, when market conditions and/or renewed competition caused prices to fall by seven per cent.

<sup>21</sup> The average stage length flown by an airline in a market was estimated by dividing, for the said market, total annual passenger-kilometres by the number of passengers.

#### **TABLE 16-29** PRICE AND OUTPUT CHANGES IN THE AIRLINE INDUSTRY 1986 - 1998 1986-1997 1995-1996 1 1996-1997 1 1997-1998 2 Price Changes (%) 0.4 6.8 **Domestic Passenger Services** 2.6 (6.7)International Passenger Services 0.7 (2.1)6.2 5.6 3.3 5.0 Air Freight Services (1.0)(6.8)Total Air Industry 1.5 (4.3)3.3 5.8 Output Changes (%) 1.5 11.4 6.3 4.2 **Domestic Passenger Services**

7.3

1.6

4.0

14.1

5.7

12.2

. \_ . . . . . . .

2 Based on first two quarters of the year

Air Freight Services

Total Air Industry

Source: Transport Canada, based on Statistics Canada files

International Passenger Services

Air transportation demand tends to evolve as a function of price changes and economic conditions. For instance between 1986 and 1993, the price of domestic services increased by 18 per cent in real terms, and demand dropped by nine per cent. From 1993 to 1997, prices fell by 12 per cent and demand surged up by 30 per cent.

From 1986 to 1997, prices for international services declined in real terms, and demand more than doubled. During this time, transborder services were the most dynamic international market, despite price increases of some 20 per cent during the last two years. Demand was stimulated by economic conditions and the introduction of new services that resulted from the "Open Skies" bilateral air agreement between Canada and the US.

In other international markets, much of the stimulated demand came from lower prices. Since 1986, the increased usage of discount fares has contributed largely to the 20 per cent decline in real terms of prices for international air services outside the US.

Turning to freight, airline activity has been volatile since at least 1986. During this time, revenues declined for seven years and increased for seven years. Revenue growth has also been modest in this market segment, with prices declining and output increasing at less than two per cent per year.<sup>22</sup> These factors suggest that Canadian carriers have not been participating in the fast-growing flow of trade by air, leaving this market to be captured by foreign carriers.

10.3

7.7

8.5

7.1

0.4

5.4

Overall, however, revenue performance in the air industry was strong between 1986 and 1997. Revenues rose every year, except between 1991 and 1993, at an annual growth rate of 5.6 per cent. From 1986 to 1991, the major source of revenue growth was higher prices, as output rose by only 1.6 per cent per year. From 1991 to 1997, the reverse occurred, as output grew annually by 5.9 per cent and prices declined by 0.1 per cent.

During the first half of 1998, the prices of both domestic and international air passenger services were firming up. Despite these

price increases, domestic demand continued to grow, lifted by a strong economy. While demand for transborder services continued to be strong, however, the market for other international services was soft, due to a weaker trans-Pacific market during the second half of the year.

Estimates suggest that half of the price increases that occurred in early 1998 resulted from the internalization of air navigation fees by the airlines. At one time, these fees were added to the price of air tickets in the form of the Air Transportation Tax.

In addition, during the second half of 1998, unused capacity in the trans-Pacific markets was transferred to other markets, precipitating stiffer price competition. The situation was also intensified by the end of the Air Canada pilots strike, as the company tried to win back its customers with seat sales.

In the end, the airlines' net yields for the new navigation fees fell sufficiently to offset the increases recorded during the first part of the year.

Table 16-29 shows price and output annual percentage changes in the airline industry from 1986 to 1997, looking closely at the changes in 1995/96, 1996/97 and 1997/98.

### **EFFICIENCY INDICATORS**

In 1997, airline labour costs amounted to less than 23 per cent of industry costs, down considerably from 1986 levels. Employment increased by eight per cent over the same period. This growth, however, was uneven. Employment peaked at 48,000 during a period of rapid

<sup>22</sup> Exercise caution in interpreting these results because the quality of the available data is limited.

increase between 1986 and 1990, then fell for four consecutive years to return to its 1986 level. In recent years, employment has picked up again, increasing by 10 per cent.

Figure 16-20 compares costs in the airline industries in 1986 with costs in 1997.

Labour productivity rose by 38 per cent between 1986 and 1997. These gains were achieved after 1991 because labour productivity fell by eight per cent between 1986 and 1991. Unit labour costs were lower in 1997 than in 1986. During the last three years, unit labour costs have dropped by 16 per cent, which equals 5.5 per cent per year.

Table 16-30 compares various efficiency indicators for the major airlines, Air Canada, Canadian Airlines International, and their affiliates, including employees, labour costs and productivity changes, from 1986 to 1997.

Fuel costs represented close to 17 per cent of total cost in the aviation sector in 1997. In recent years, the fuel cost share has risen, due to increases in domestic fuel prices. Fuel efficiency gained 18 per cent in the airline industry. As for labour, much of these gains have been recent. Other notable operating expenses are: marketing at 12.5 per cent, landing fees at three per cent, and food and beverage costs at four to five per cent.

Capital costs are on the rise in the airline industry, accounting for 17 per cent of industry costs. This reflects the impact of fleet renewal in the late 1980s and early 1990s. Per unit of output, the value of all fixed assets has increased by 41 per cent in real terms since 1986. The effect of this increase was moderated by reduced capital costs.

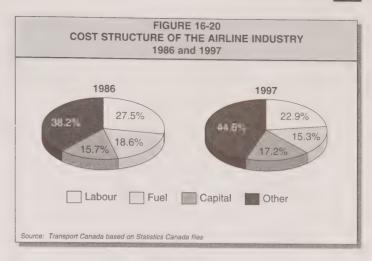


TABLE 16-30 EFFICIENCY INDICATORS FOR THE MAJOR AIR CARRIERS AND THEIR AFFILIATES, 1986 – 1997					
	1986	1995	1996	1997	
Employees (000)	39.6	40.6	41.3	42.9	
Average Labour Cost per employee (\$000)	37.2	46.9	49.6	49.6	
Productivity Change (%)	1986-97	1994-95	1995-96	1996-97	
Labour	3.0	6.3	10.1	3.9	
Total	1.0	2.1	8.7	1.2	
Unit Cost Change (%)					
Labour	(0.1)	(8.1)	(3.9)	(3.7)	
Total	1.2	0.8	(4.5)	(2.5)	
Source: Transport Canada, based on Statistics	Canada files				

Total factor productivity in the airline industry reached a low in 1991, registering at 13 per cent below 1986 levels. Since then, productivity has risen by 28 per cent, with particularly strong performance in 1996. In 1991, unit costs in the air transport industry were 32 per cent higher than in 1986, but they have declined since then by 14 per cent between 1991 and 1997.

The performance of the airline industry can be segmented between the two major Canadian carriers, Air Canada and Canadian

Airlines International, and their affiliates, the regional airlines. As Figure 16-21 shows, their productivity performance followed basically the same trend. The exception is 1997, when a strike occurred at the regional airlines affiliated with Air Canada.

However, the performance of the regional carriers in relation to the larger carriers has been lagging since 1991. In that year, the productivity growth of the two groups of carriers was basically the same, while in 1997, the productivity of the regional

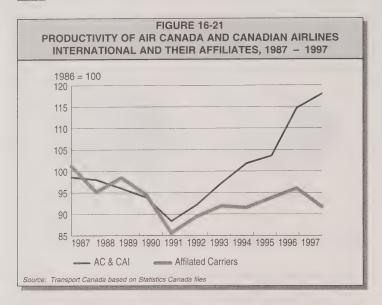


TABLE 16-31 COST SAVINGS AND PRICE REDUCTIONS FOR MAJOR AIR CARRIERS AND THEIR AFFILIATES 1997 vs 1992-97 Average				
	1997	1992-1997 Average		
Carrier Cost Savings (\$ million)	1,980	1,241		
User Price Savings (\$ million) Cost Savings Passed to Users (per cent)	800 40.4	538 43.4		
Source: Transport Canada, based on Statistics Canada files				

carriers was 22 per cent below that of the larger carriers.

### IMPACT OF PRODUCTIVITY

Table 16-31 shows estimated cost savings from productivity gains for major carriers, Air Canada and Canadian Airlines International, and the users of their air services. The table covers 1992 to 1997.

Carriers' cost savings equal the difference between the actual costs of the carriers and the costs they would have incurred if their unit cost had increased at the same pace as the economy as a whole. Such a formulation was used to

measure the impact of lower prices increases on carriers' revenues.

Between 1992 and 1997, strong productivity performance allowed the major air carriers to achieve cumulative annual savings. By 1997, these savings reached \$2 billion or 15 per cent of the airline industry cost base. The carriers passed on some 40 per cent of the cost savings to the users in the form of lower prices. Instead, the carriers used the savings to make up for their poor financial performance during the early 1990s. In 1998, lower efficiency gains and higher input prices are expected to affect these gains.

### FINANCIAL PERFORMANCE

The profitability of the two major airline corporations, Air Canada and Canadian Airlines International, has tended to fluctuate from one year to the next. Figure 16-22 shows trends in their costs and prices, which help to explain some of the volatility in their profitability since the late 1980s.

Between 1989 and 1991, the carriers' unit costs rose sharply, significantly above price increases. While costs started to decline in 1992, prices were also depressed due to recession. Their profitability started to improve in 1994, resulting from price increases and cost reduction measures. In 1996, intensified competition in the industry depressed prices. However, this was somewhat offset by further cost reductions. Benefiting from the strong performance of the global economy, the combined revenues of Air Canada and Canadian Airlines increased sharply with strong growth in both output and prices during 1997.

Table 16-32 highlights the financial results of the air transport industry from 1990 to 1998.

The financial results of Air Canada and Canadian Airlines reflect their price, cost, output and productivity performance over the past decade. In the early 1990s, operating expenses exceeded operating revenues, with an average industry operating ratio at 102 per cent.

In 1997, Air Canada and Canadian Airlines generated a combined total operating revenue of \$8.6 billion. Their operating profits rose to \$465 million and average operating ratios improved to 94.6 per cent, approximately four per cent lower than in 1996. The large independent carriers also showed improved profitability in 1997.

In 1998, the profitability of Air Canada and Canadian Airlines was adversely affected by a number of unexpected events, including the ice storm in eastern Canada, the economic crisis in Asia and the pilot strike at Air Canada. Partial data from other large airlines also indicated a deterioration of profit margins during the year.

Despite several negative internal and external factors, combined total corporate revenues of the two major carriers amounted to \$9.1 billion, an increase of eight per cent over 1997. Both domestic and US transborder revenues showed strong growth, but international passenger revenues declined, particularly on Pacific routes.

Total operating expenses of these two airlines increased by ten per cent in 1998, higher than their revenue growth. As a result, their average operating ratio deteriorated to 98.7 per cent. Higher navigation fees were transferred to users in the ticket prices, but higher labour costs and the weaker Canadian dollar drove costs even higher. Lower Canadian currency exchange rates against the US dollar contributed to higher costs because aircraft fuel, rent and materials are partly paid in US currency.

In order to restore their profitability, both Air Canada and Canadian Airlines have announced a number of initiatives to be implemented during the coming year, including fleet capacity rationalization and workforce reduction. For instance, Air Canada plans to reduce 1,275 employees by February 1999 and a further

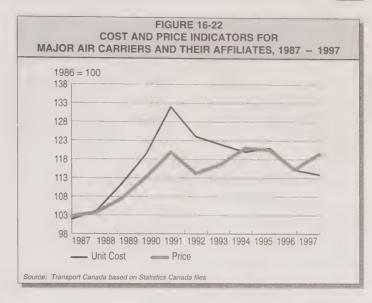


TABLE 16-32 SUMMARY FINANCIAL RESULTS OF THE AIRLINE INDUSTRY 1990 - 1998						
	Average 1990-1993	1994	1995	1996	1997	1998
Air Canada and Canadian Airlines						
Revenue (\$ million)	6,376	6,989	7,644	7,976	8,648	9,103
Expenses (\$ million) <sup>1</sup>	6,496	6,690	7,395	7,856	8,182	8,981
Operating income (\$ millio	on) (120)	299	248	121	465	122
Operating ratio (per cent)	101.9	95.7	96.8	98.5	94.6	98.7
Larger Independent Car	riers <sup>2</sup>					
Operating ratio (per cent)	99.2	95.5	94.4	97.1	94.0	n/a
Sources: 1 Corporate consolidated res 2 Transport Canada based o			C and CAIL			

TABLE 16-33 CAPITAL EXPENDITURE IN THE AIRLINE INDUSTRY 1986 – 1997						
Annual Averages in \$ Million						
	Gross	Depreciation	Net			
1986-1987	380	285	95			
1988-1992	1,847	677	1,170			
1993-1995	788	957	(169)			
1996-1997	1,414	1,046	369			
1986-1997	1,197	708	490			
Source: Special Compilations of Statistics Canada	а					

450 by the end of 1999, representing a 7.5 per cent reduction in workforce. Canadian Airlines' main strategies include gaining more market shares through new customer services and forging strong global alliances with other airlines.

The two major airlines' total capital expenditures increased significantly in 1998. As traffic growth has slowed down, however, capital spending on flight equipment is expected to decline in 1999.

### CAPITAL EXPENDITURE

From 1986 to 1997, capital expenditure<sup>23</sup> in the airline industry amounted to \$1.2 billion per year. In constant dollars, the net assets of the airline industry increased much more rapidly than output growth during this time.

Table 16-33 illustrates the variability of capital spending in the airline industry. The periodic variation in capital expenditures is partly due to the life cycle of flight equipment. Capital spending of less than \$400 million a year in the mid 1980s climbed to \$2 billion per year from 1988 to 1992. In the period following, 1993 to 1995, capital spending was more than halved. Since 1996, airlines' capital spending has picked up.

<sup>23</sup> Includes acquisition of fixed assets, owned or leased, excluding land, by all airlines.



Transport Transports Canada Canada

### READER RESPONSE CARD

TRANSPORTATION IN CANADA 1998 - ANNUAL REPORT

Organization:
• Which section(s) of the Annual Report did you find of interest to you? (Use ✔) Report Highlights [ ] 5. Transportation and Environment 1. Introduction [ ] 6. Transportation and Energy [ ] Technology [ ] 2. Transportation - The Economy 7. Transportation and Energy [ ] Transportation Infrastructure [ ] Economy and Sector Productivity [ ] Regional Economies [ ] 13. Industry Structure [ ] 3. Government Spending on 8. Transportation and Employment [ ] 14. Freight Transportation [ ] Transportation [ ] 9. Transportation and Trade [ ] 15. Passenger Transportation [ ] 4. Transportation and Safety [ ] 10. Transportation and Tourism [ ] 16. Price, Productivity and Financial Performance [ ]
Use the following rating figures to answer the next two questions  1. To a great extent 2. To some extent 3. Very little 4. Not at all 5. No opinion
• To what extent does the report meet your requirements in the following areas?  accuracy of the information currency of timeliness of the information provided comprehensiveness
• To what extent are you satisfied with the format and presentation of the report?  writing style graphics presentation (clear, concise, etc.) (table and figures) presentation (flow of the report)
What do you feel should be done to improve the quality, format or presentation of this Annual Report?
For further information, please telephone (613) 993-4541 or fax message to (613) 957-3280.  Transport Canada Transports Canada Transports Canada Transportation in Canada 1998 - Annual Report
Organization:
<ul> <li>Which section(s) of the Annual Report did you find of interest to you? (Use          ✓)         Report Highlights</li></ul>
Use the following rating figures to answer the next two questions  1. To a great extent 2. To some extent 3. Very little 4. Not at all 5. No opinion
• To what extent does the report meet your requirements in the following areas?    accuracy of the information
accuracy of the relevancy currency of timeliness level of details comprehensiveness





Canada Post Corporation Société canadienne des postes Postage paid Port payé if mailed in Canada si posté au Canada Business Reply Réponse d'affaires

0209372399





0209372399-K1A0N5-BR01

TRANSPORT CANADA, ACA **ECONOMIC ANALYSIS** PLACE DE VILLE 330 SPARKS ST OTTAWA ON K1A 0N5

TRANSPORTS CANADA, ACA ANALYSE ÉCONOMIQUE PLACE DE VILLE 330 RUE SPARKS OTTAWA ON K1A 0N5





Canada Post Corporation Société canadienne des postes Postage paid Port payé if mailed in Canada si posté au Canada Business Reply Réponse d'affaires

0209372399



01



0209372399-K1A0N5-BR01

TRANSPORTS CANADA, ACA ANALYSE ÉCONOMIQUE PLACE DE VILLE 330 RUE SPARKS OTTAWA ON K1A 0N5

TRANSPORT CANADA, ACA **ECONOMIC ANALYSIS** PLACE DE VILLE 330 SPARKS ST OTTAWA ON K1A 0N5



ISBN-0-662-27586-1



Cat. No. T1-10/1998E ISBN 0-662-27586-1







